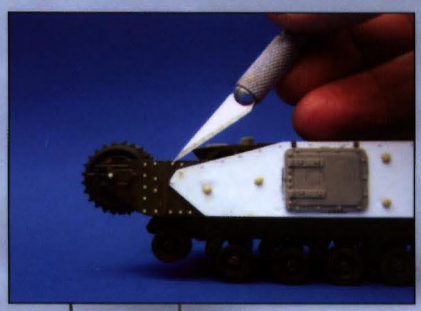
Osprey Modelling

OSPREY PUBLISHING

Modelling the Churchill Tank

Mark J Bannerman

Consultant editor Robert Oehler



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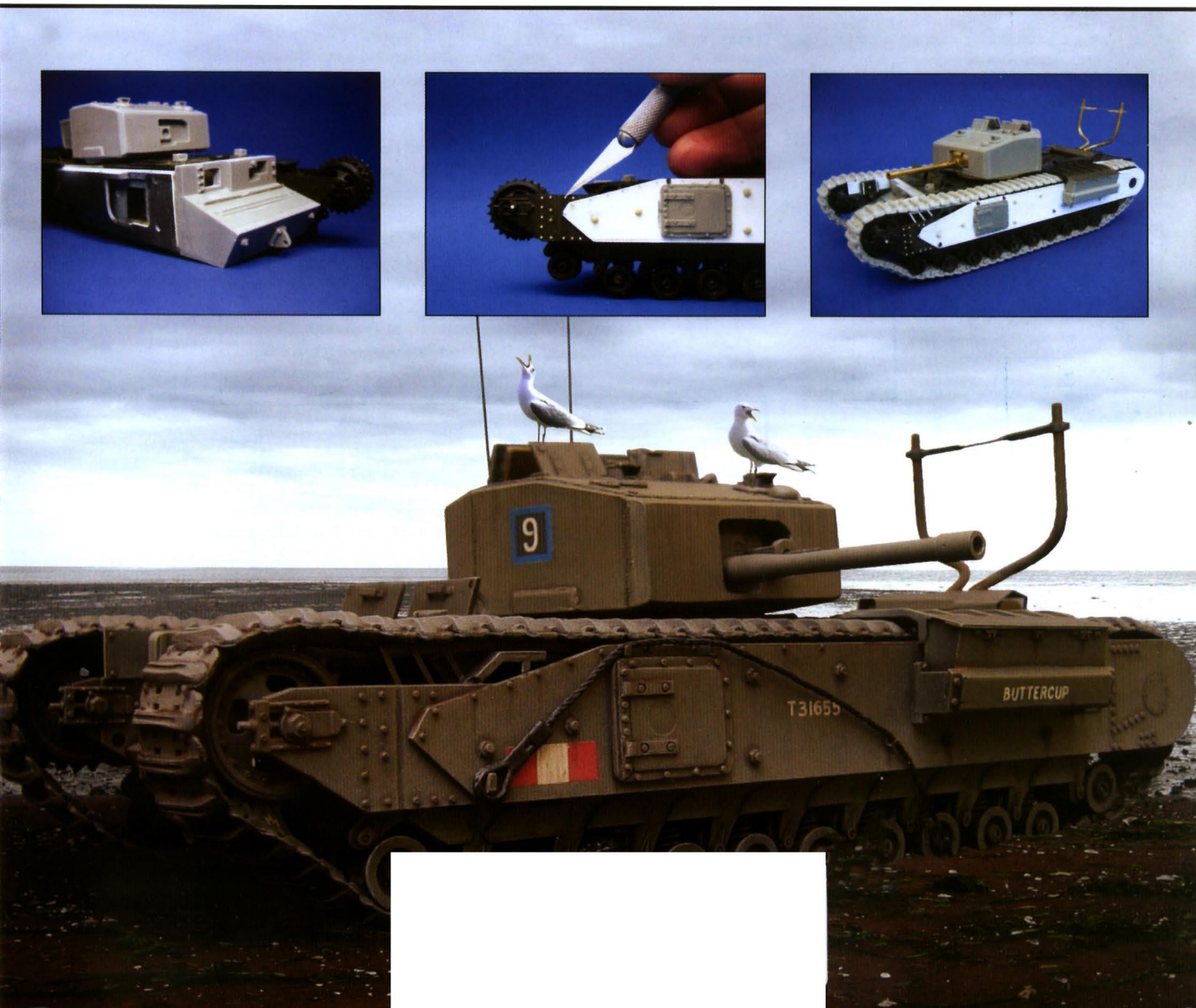

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Imperial War Museum, England
Aberdeen Museum, USA
Musée des Blindées at Saumur, France

Contents

Introduction

This tank carrying my name has more drawbacks than me.

Winston Churchill

The purpose of this book is to present techniques and methodologies for building scale replicas of the Churchill Infantry Tank. With such a diverse and extensive subject to cover in a modelling book, the challenge was in the selection of variants that best represent the most common types of Churchill. Moreover, it was equally as important to choose projects that would enable the reader to use the methodologies presented herein as a 'stepping-stone' to modelling, with some adjustments and modifications, the many other variants and types of Churchill tanks.

This book presents the reader with several Churchill variants using the plastic Tamiya kit as the skeletal basis of the projects with several after-market conversion kits and accessories and also demonstrates scratch-building techniques. In each chapter, the construction will be described in detail. Explanations will be provided on various paint applications with hints and tips on making models look more realistic using several weathering techniques. It will also offer methods to personalize a model with accessories and figures with suggestions on ways of creating an atmospheric setting to accommodate the model.

It can be said that the number of full Churchill kits in 1/35th scale is quite limited. There have been several releases in resin but these are now out of production; however, at the time of writing several full resin kits by Cromwell have been announced. In the plastic realm, the Tamiya 1/35th-scale offering of the Churchill tank has been in existence for close to 30 years and comes in two variants: the Churchill VII and the Churchill Crocodile. Both of these kits are identical with small alterations and inclusions to alter the kit between a flamethrower Crocodile and a gun-tank Churchill VII. The Tamiya offering is very

A Churchill Mk.I, at Worthington Park Museum, Canadian Forces Base Borden, Canada. (Chris Johnson)

A Churchill Mk.III at Aberdeen Proving Grounds, Maryland. (Cookie Sewell)

A Churchill Mk.III AVRE, at Bovington, UK. (Chris Shillitos)

affordable, readily available and the only 1/35th plastic 'kit on the block'. The kit stills stands as an excellent scale-representation and over the past few years, aftermarket manufacturers have introduced a wide assortment of accessories and conversions for it.

Brief overview of the Churchill

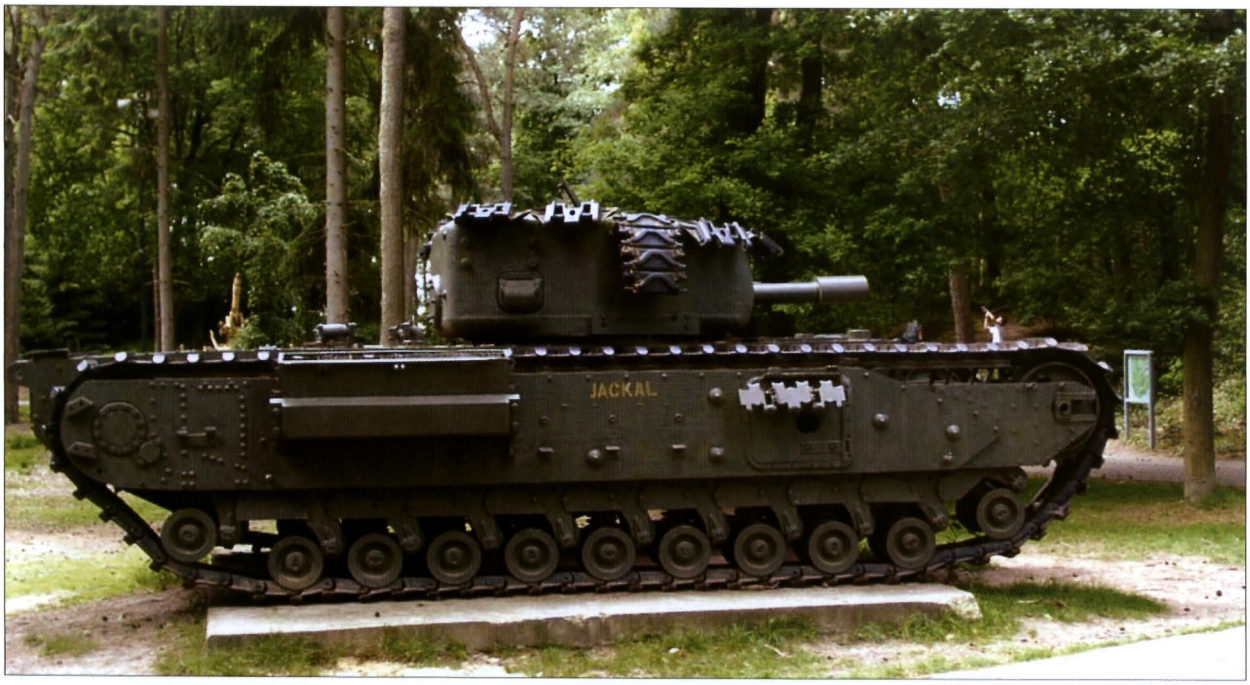
It would be impossible to cover the developmental and operational history of the Churchill tank in the limited space of this book. Fortunately, the Churchill is one of the most widely covered British tanks in print and there is no shortage of information, references and wartime photographs available to the modeller.

The Churchill first entered service in the British Armoured Corps in 1940, and the last one was taken out of service in 1976. The Churchill tank was the second-highest produced British tank of World War II with approximately 5,700 being delivered (the Infantry Tank Mk.III Valentine was the most widely produced). The Churchill saw service in North Africa, Italy, France, Holland, Belgium, Germany, Russia (Lend Lease), and after World War II, it also saw service in India, Korea, Jordan, and in Ireland.

The initial Churchill design was an updated World War I-type tank designed in 1939 for conditions reminiscent of the Great War, with mounted guns on the sponsons in the first tank design. The tank entered combat before most of the design flaws had been corrected.

ABOVE A superb example of a Churchill VII at Bovington, UK. (Chris Shillitos)

BELOW A Mk.I or II upgunned to a Mk.IV, with a mounted 75mm gun and Mk.VII suspension, located at Bovington, UK. (Chris Shillitos)



ABOVE A Churchill Mk.V at the National War & Resistance Museum in Overloon, Holland. (Éric Peytavin)

BELOW A Churchill Mk.VI at the Musée des Blindées, Saumur, France. (Patrick Kraft)

The Infantry Tank Mk.IV Churchill I was armed with a 2-pdr. gun in the small cast turret with a hull mounted 3in. gun; the Churchill II was similar, but the 3in. inch howitzer was replaced with a 7.92mm BESA machine gun. Generally, both mark types had uncovered tracks. These marks were made obsolete following service failures at Dieppe and in Tunisia. The Churchill III was an improved design mounting a 6-pdr. gun (long or short L43 or L50 versions; the L50 had a counter-weight at the muzzle) instead of the 2-pdr. and also had a redesigned welded turret with an improved engine. The Churchill IV, the most numerously produced Churchill, was similar to the Churchill III but was fitted with a new cast turret. The Churchill V CS served as a 'Close Support' tank mounting a 95mm howitzer while the Churchill VI was identical to the Churchill IV but mounted a British 75mm QF (Quick Firing) gun. The Churchill VII, sometimes referred to as the 'Heavy Churchill', was a completely redesigned variant from the earlier marks. It was fitted with a new hull, up-armoured protection, and was armed with the 75mm QF gun with an all-round vision cupola. This version first saw service in Normandy, 1944.

The Churchill VIII was identical to the Churchill VII with the 75 mm QF gun replaced with a 95mm Howitzer, and the Churchill IX was a Churchill III or IV upgraded with the turret and armour of a Mk.VII mounting a 6-pdr. gun. The Churchill X was a modified Mk.VI with armour upgraded to that of the Mk.VII and the Churchill XI represents an armour-upgraded Mk.V.

The most common derivative gun tanks of the above include the Crocodile, which represents a Churchill VII with a flame-thrower device mounted in the front hull with trailer linkage. The AVRE (Armoured Vehicle, Royal Engineers) was a modified Churchill III or IV with a 290mm Petard Spigot mortar. The Churchill NA 75 represents a Mk.IV fitted with a US M3 75mm gun as used on the Sherman and the coax armament was replaced with the US .30-cal. Browning.

There were several dozen specialized engineering and experimental types of Churchills that served many roles during and after World War II. These include the Fascine, ARK, SBG and the Churchill CIRD.

Post-war development of the Churchill also resulted in the limited production of the A43 Infantry Tank, Black Prince that was basically a Churchill Mk.VII with a wider hull and larger turret mounting a 17-pdr. gun. The A41 Centurion, termed the 'Super Churchill', was also developed and weighed 50 tons with 6in. thick armour on the turret front.

The author with a Churchill Mk.IV at the Cinquantennaire Museum in Brussels, Belgium. (Elizabeth Bannerman)

Churchill types and variants

Type	Notes
Churchill I	Cast turret with 2-pdr. and coaxial BESA machine gun
Churchill II	3in. howitzer replaced with BESA machine gun
Churchill III	6-pdr. in new welded turret and new air intakes
Churchill IV	Similar to Mk.III but with cast turret
Churchill IV (NA 75)	Similar to Mk.IV and fitted with Sherman 75mm
Churchill V (CS)	Similar to Mk.IV but with 95mm howitzer
Churchill VI	Mk.IVs fitted with 75mm QF gun
Churchill VII	Thicker armour, round escape doors, with 75mm QF gun
Churchill VIII CS	Churchill VII mounting a 95mm gun
Churchill IX LT	Mk.III and IV reworked but same turret retained
Churchill X	Mk.VI reworked as Mk.IX but with 75mm
Churchill X LT	Mk.VI reworked but same turret retained
Churchill XI	Mk.V reworked with heavy turret with appliqué armour
Churchill XI LT	Mk.V reworked but same turret retained
Churchill Oke	Mk.II with Ronson flame-thrower in hull
Churchill Crocodile	Mk.VII modified with trailer and flame-thrower
Churchill ARVE	Mk.III or IV with Petard 29cm-cal. mortar fitted to turret
Churchill ARV Mk.I	Mk.I or II with turret removed. Bren Twin AA mount
Churchill BARV	Similar to ARV; plates fitted on suspension and wading gear
Churchill ARV Mk.II	Turret removed and replaced with spade and jibs
Churchill Ark Mk.I	Bridge carrying vehicle
Churchill Ark Mk.II (UK Pattern)	As Mk.I but wider trackways
Churchill Ark Mk.II (Italian Pattern)	UK Pattern with US ramps
Churchill Bridgelayer	Removed turret, support vehicles up to 60 tons
Churchill with ARMA Mk.IIe	Added anti-mine roller attachment
Churchill with AMRCR	Experimental anti-mine reconnaissance castor roller
Churchill with CIRD	Mine roller produced by the Canadians
Churchill with Ploughs A–D	Added experimental agricultural ploughs
Churchill with Bullshorn/Jeffries	Ploughs used for Normandy landings
Churchill AVRE with Bobbin Mk.I and Mk.II	Canvas mat 10in. wide
Churchill AVRE with Log Carpet Device	Carpet of 100 6in.-diameter logs
Churchill AVRE with Twin Bobbins	One bobbin of canvas and one of chespaling
Churchill TLC Laying Devices	Laying device used on beaches to prevent bogging
Churchill AVRE with Fascine rollers	
Churchill AVRE with Twin Carpet Rolls	
Churchill AVRE with Carpet role Type D	
Churchill AVRE with Mine-Plough	
Churchill AMRCR with mine-rollers	
Churchill with SBG Assault Bridge (Early type)	
Churchill Folding SBG Assault Bridge (Late type)	
Churchill AVRE with towed Bridge	
Churchill AVRE for building Bailey Bridge	
Churchill AVRE with Jumbo-Bridge	
Churchill AVRE ARK MK-I	
Churchill AVRE ARK MK-II	II (Italian Pattern)
Churchill 3in. Gun-Carrier	
Churchill Snake-Carrier	
Churchill Demolition	

Accessories, tools and materials

Essential tools

The most important item in any modeller's tool box is the hobby knife. There are different types of knives; the most useful is the X-acto knife with replaceable blades. The hobby knife is used to remove plastic parts from sprue or photo-etch from its fret, scrape away seam lines on parts, or remove excess plastic or resin.

Other important tools are different grades of files and grits of sandpaper, both widely available at hobby stores and hardware outlets. Inexpensive emery nail files (available at drug stores) are also useful, because they can simply be discarded once they get clogged with plastic or resin residue. Metal files and sandpaper serve to smooth out rough surfaces and edges beyond the abilities of a hobby knife. It should be noted that filing and sanding does create considerable dust and to avoid inhaling this, it is a wise investment to purchase a mask to cover mouth and nose, particularly when sanding resin. Nail clippers or small nail scissors are ideal for removing parts from sprues and are particularly useful for cutting photo-etch parts from their frets, or removing nasty pour plugs on plastic and resin kits.

One critical, yet inexpensive, accessory for successful modelling is a box of wooden toothpicks (the flat type). These are used for stirring paint; applying glue in tricky, hard-to-reach areas; mixing up epoxy glues; and for many other purposes that will be covered in later chapters.

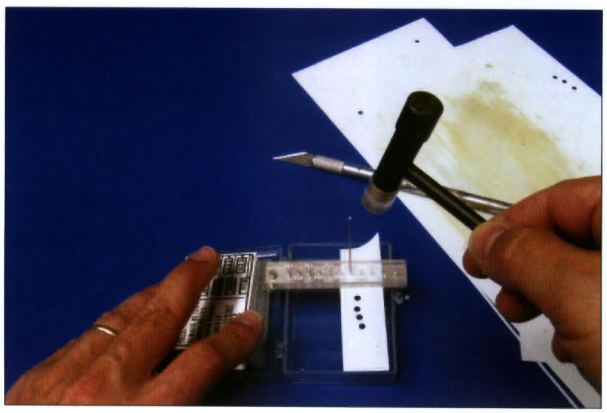
Glues come in different forms: plastic glue (liquid or tube), epoxy glue and cyanoacrylate ('superglue'). Each of these is available in a variety of strengths, and should be handled with great care. Plastic glue is only effective on polystyrene kit surfaces, and works by melting and welding the surfaces together. Epoxy glues usually come in two parts – a hardener and an adhesive – which are mixed together and dry in 5–10 minutes. Epoxy glues are useful where one needs a strong bond, such as on heavy white metal or resin parts. Cyanoacrylate glues provide the ideal bonding agent for photo-etch, smaller resin parts and plastics, and dry in seconds. Another bonus is versatility in that

My compressor and dual action Iwata HP-B airbrush.

LEFT AND BELOW LEFT An assortment of blades and Dremel bits, an X-Acto knife, a compass (for measuring spaces between rivets), a metal file, and tweezers and nail clippers for snipping photo-etch.

The weathering pigments used on all projects in this book.

Oil paints and mild thinners for washes and weathering purposes.



A punch and die set for making different-sized rivets.

A 'small' collection of after-market rivets and bolts.

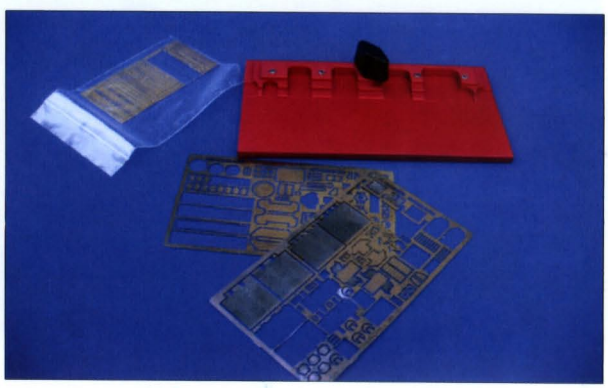
they will allow you to bond different mediums to one another (i.e. resin to plastic, metal to resin, etc.)

Epoxy putty is ideal for filling gaps or creating rough-textured surfaces, and, once dry, can easily be sanded, cut or shaped. Various hobby companies produce their own brands, including Squadron, Tamiya and Humbrol. Milliput is another brand popular among modellers. Epoxy putty designed for automotive bodywork is just as effective.

The finishing process is just as important as the construction of a model, and, therefore, there are several considerations when making decisions on finishing and painting techniques. The modeller has hundreds of brushes to choose from with prices ranging from very cheap to the obscenely expensive. It is best to purchase brushes with real hair rather than the synthetic type. It is also ideal to have five or six different brushes of varying sizes – one of each of the following: '00', '0', '1', '2' and '3', a liner-brush and a 1cm -wide flat brush. Although prices do range considerably, these are generally inexpensive.

As far as paints go, there are a several options open to the modeller. The two most popular types of paint are enamels and acrylics. Whatever type one uses is a personal decision, rather than one type being 'better' than the other. Enamel-based paints (Humbrol, Xtra Colour, for example) are generally porous in nature, take longer to dry, and need to be mixed very well before being applied. Acrylic paints (such as those from Tamiya, Vallejo, and Gunze) dry in a matter of minutes, and are relatively easy to work with; clean up is minimal, but sometimes they dry glossy or semi-glossy. As I will explain in the following chapters, for some purposes, I prefer to use acrylics; while for others, I use enamels.

The following chapters will also cover other extremely useful tools such as the Etchmate, Optivisor, Grabhandler, punch and die set and jeweller's hacksaw, which are not absolute necessary tools but very handy in facilitating a modeller's tasks.



The Etchmate by Mission Models – a very handy tool for bending photo-etch.

Churchill Mk.III, 14th (Canadian) Calgary Tank Regiment, Dieppe, 1942

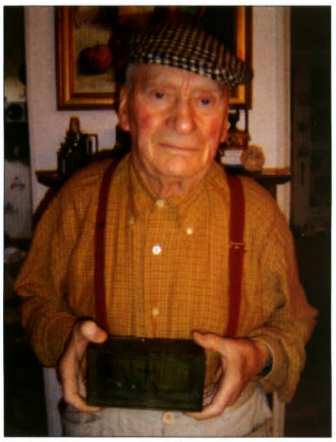
Subject:	*Churchill Mk.III, 14th (Canadian) Calgary Tank Regiment, Dieppe, 1942*
Modeller:	*Mark Bannerman*
Skill level:	*Intermediate*
Base kit:	*Tamiya Crocodile*
Scale:	*1/35*
Additional detailing sets used:	*Castoff Churchill Mk.III conversion kit* *Eduard Etch detail set* *Accurate Armour tracks and tow cables* *Nuts'n'Bits 6-pdr. gun, exhaust extenders, BESA machine guns, mounting plate*
Painting and weathering:	*MIG weathering pigments* *Tamiya acrylics and Winsor & Newton oils*

Courage is rightly esteemed the first of human qualities, because it is the quality that guarantees all others.

Winston Churchill

The raid on Dieppe of August 19, 1942, lasted nine hours; the main attack on the town itself involved landing 29 Churchill tanks on a heavily fortified beach. The Churchill tanks were manned by the 14th (Canadian) Calgary Tank Regiment and comprised Churchill Is and IIs, and 19 Churchill IIIs including two types of experimental variants: the 'Oke' flamethrower and the TLC Carpet-Laying Device. All 29 Churchills met a fateful end and either sank before reaching shore, were hit by enemy fire on the beach or were brought to a complete halt by the shingle banks and pebbled beach.

LEFT A composite image of the Churchill Mk.III on the Dieppe beach. (Ulf Anderson)



Monsieur Jean Gosselin of Dieppe holding his prized souvenir of a cross target, which he salvaged as a young boy from one of the wrecked Churchills shortly after the raid.

The Churchill Mk.III represents the first major change in the tank's production history with the mounting of a 6-pdr. gun and the addition of a new and larger welded turret. The focus of this chapter is the conversion of Tamiya's Crocodile offering to a Dieppe Churchill III using the Castoff resin conversion kit, Accurate Armour's resin tracks and tow cables, Eduard's photoetch set and several sheets of styrene. This is not a difficult conversion but does require good plans and detail photos of the Churchill III specific to Dieppe.

The Crocodile tank and the Churchill VII are virtually complete redesigns of all of its predecessors and several major alterations on the Tamiya plastic kit were necessary to backdate it to a Mk.III variant. The major modifications included replacing the turret and front nose of the hull, adding rectangular shaped side-escape hatches on redesigned mud channel sidings, and replacing the driver's vision hatch on the front hull plate (see also the *Tips and tricks* chapter at the end of the book for a full 'tweak list').

Building the model

I started on the project by reworking the lower hull. All Churchill marks previous to the Churchill VII/Crocodile had a distinctive frontal hull. The front hull was replaced with the Castoff resin offering. To accommodate the replacement part, the plastic kit's hull nose was sawed right back to the second raised portion of the driver's plate slot, including the two horns for locating the driver's plate. With a jeweller's hacksaw and a little patience, this should take no more than a few minutes. The area was sanded flush and evenly before attaching the resin replacement with five-minute epoxy.

Any gaps between the plastic and resin were filled with Motomaster glazing and automotive spotting putty (orange putty). I inadvertently sanded too much plastic on the right side hull and filled the void with thin strips of plastic styrene to make up for the shortfall. Once the epoxy glue and putty were thoroughly dry, I sanded the area down gently with 600-grit sandpaper where the two joints (plastic and resin) meet, to smooth out the transition. A small amount of liquid glue was also applied directly to the area to help further smooth out the sandpaper scratches.

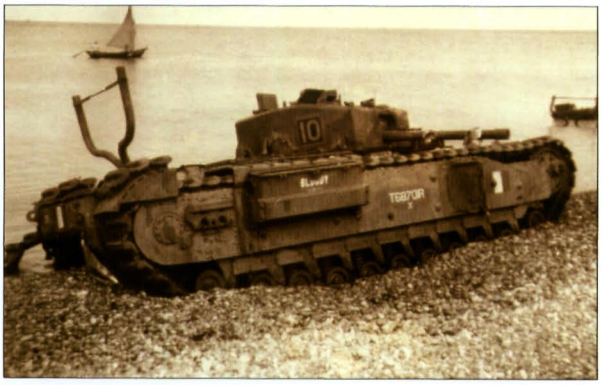
On the upper hull, there was some work required to accurately depict an earlier Churchill variant. All Churchills prior to the Mk.VII had two periscopes – and not three as per the kit – and should be half the size of the Tamiya pre-moulded offering. The outer two periscopes were shaved down to the moulded-on visor plates while the middle periscope and base-plate were completely removed. The two outer periscopes were replaced with the resin offering included in the Castoff conversion kit.

Another alteration on the upper hull was the partial removal of the ribbed track guards. I used a jeweller's hacksaw for this task. I kept the saw flush along the joint where the upper track guards meet the flat upper hull surface of the kit, and I sawed right back to the 12th rib where the turret protection ring on the track guards swing back to meet the upper hull. I then sawed about 5cm off the track guard from the rear leaving a 4cm stretch of track guard attached to the upper hull above the air intakes. This may seem a daunting task but took less than 30 minutes to complete. Again, a small hacksaw and a steady surface are critical in making this task easier to accomplish.

The outer mud channel plates of a Churchill III are considerably different in design to the Crocodile's. The new mud channel side plates were drawn out to correct size on .20-thickness Evergreen sheet styrene and were further tailored to shape with sandpaper and good photographic references. I also used a punch and die set to make a series of rivets (size .28) for the upper length on the hull plates, added Castoff resin bolts and attached Eduard photo-etch cable attachments with conservative amounts of superglue.

The Tamiya kit turret was completely discarded and replaced with the Castoff offering. The Castoff turret is a superb rendition of the Mk.III type and

A German wartime photo of a Dieppe Mk.I. (Jay Laverty)



A German photo of 'Bloody' at Dieppe. (Jay Laverty)

The Mk.III 'Bob' at Dieppe. (Jay Laverty)

The Mk.III 'Blossom' of 9th Troop. (Jay Laverty)

A wartime photo of a Mk.II. (Jay Laverty)

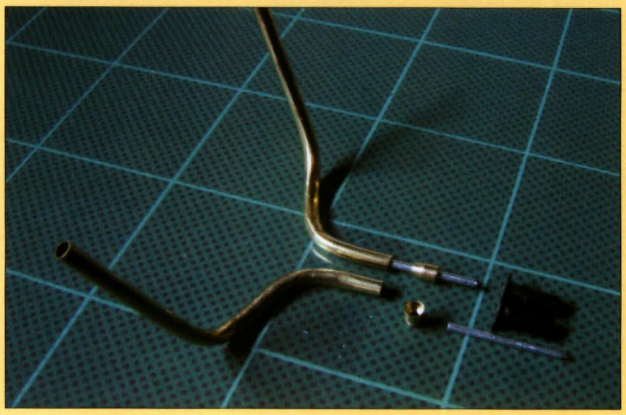
is dimensionally accurate based on three drawings and plans. It is also hollow, which allows for some interior detailing. The resin bin included with the Castoff conversion was discarded, as Dieppe Churchills did not mount bins. On the rear engine deck, the six moulded-on grab handles were sanded down to accommodate the Eduard photoetch offering and the etch exhaust covers were used to replace the plastic offering.

At this point, I opted to attach the tracks. Typically, I would attach tracks after painting the model. However, resin tracks require considerable handling of the model, which could potentially mess up a paint job. For this reason, I

In focus: making the exhaust extender

The material used includes a few large brass tubes to bend the exhausts to a correct curvature, some small brass tubing for the exhausts, and aluminium tubing to fit inside the brass tubing.

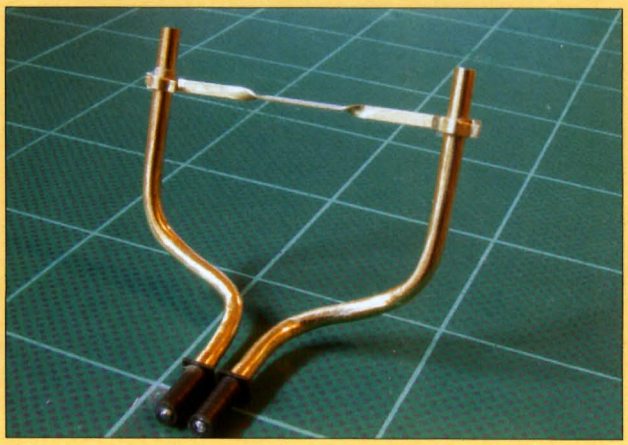
Bending the brass tube (with the aluminium tubing on the inside) to the correct angle using references photos.



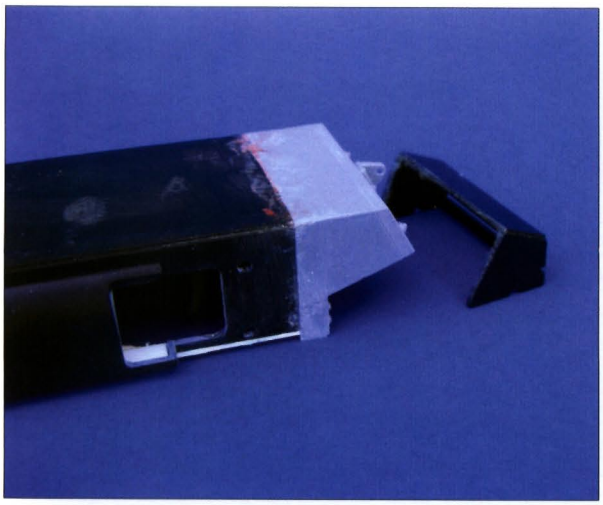
Final bending is carefully done and adjusted to fit the plastic exhaust base.

A flat metal support to keep the exhausts aligned was shaped using thin brass stock.

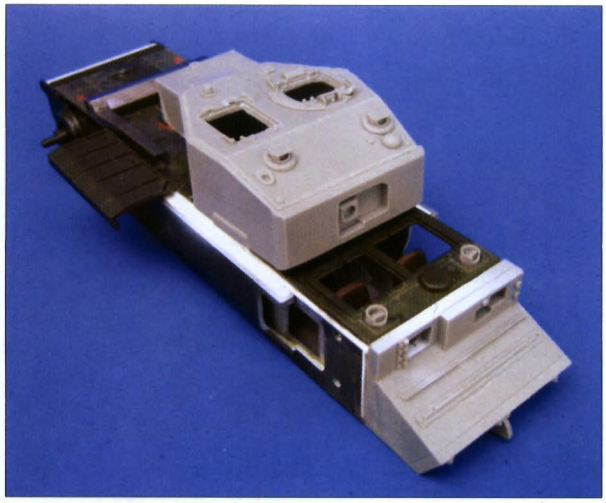
Using flat and rounded tweezers, the support was bent and shaped around the exhaust.



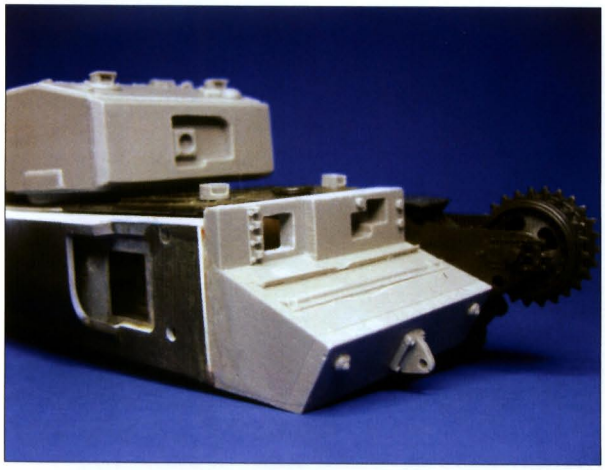
The final item with the Tamiya exhaust base support attached.



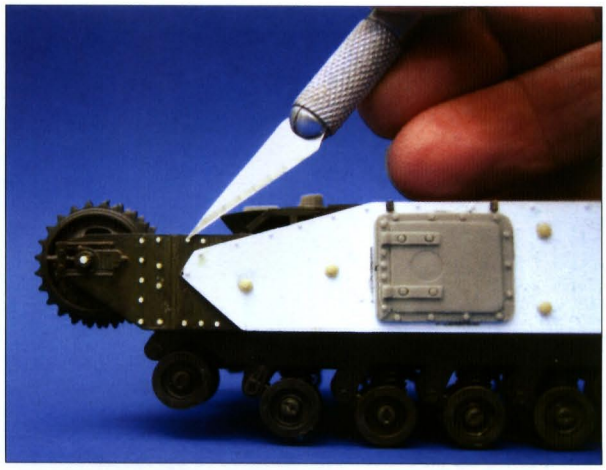
The Tamiya hull nose was removed and replaced with the resin Castoff Mk.III conversion offering.



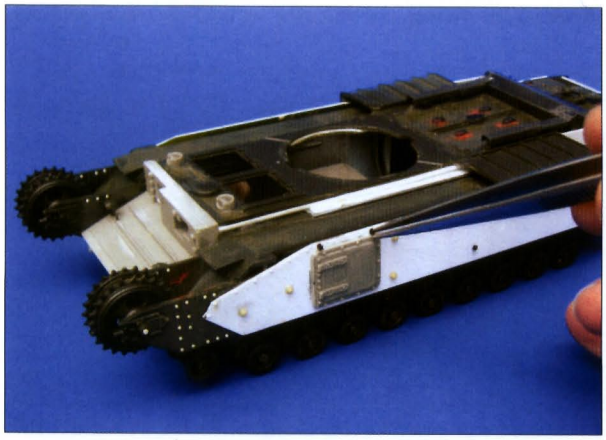
Thin strips of sheet styrene were applied to fill the gaps.



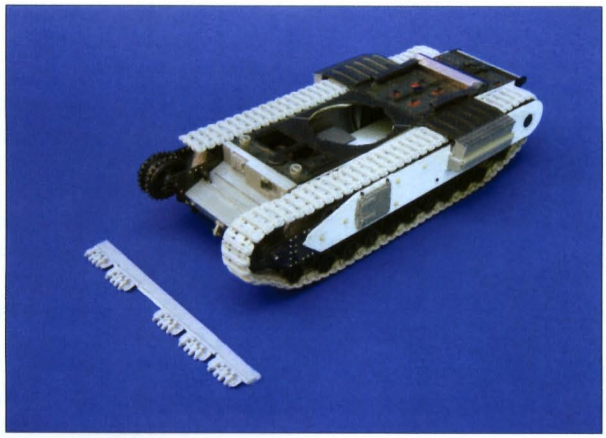
The sponsons were attached as per the Tamiya instructions.



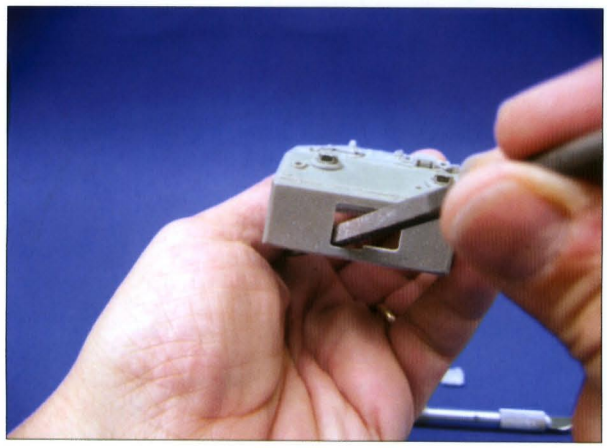
Scratchbuilt mud channel side plates and rivets were added.



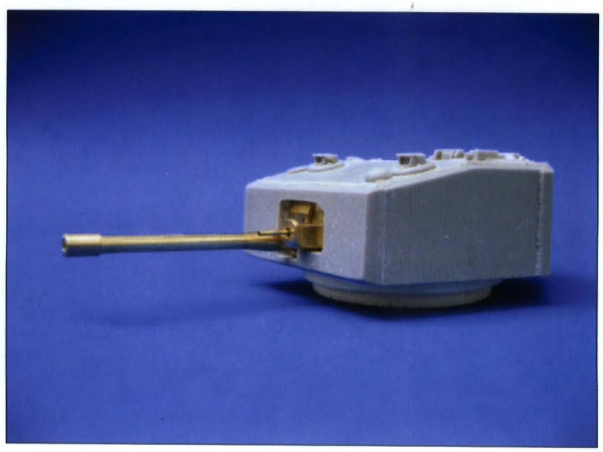
Adding photo-etch to the left side of the project.



Accurate Armour resin tracks were applied to the tank.

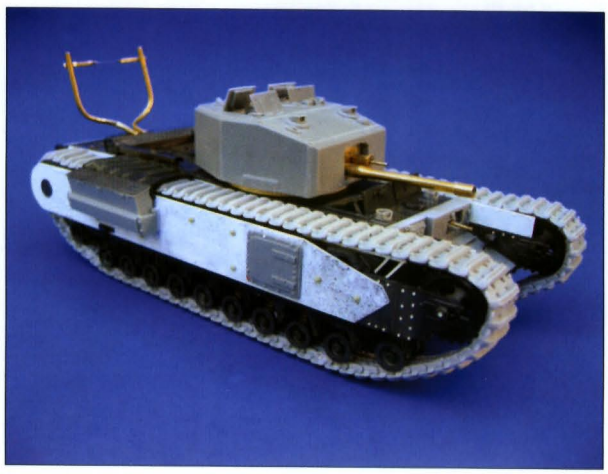


Sanding and cleaning the front aperture of the Castoff turret.



Brass replacement parts for the 6-pdr. gun and BESA machine guns, customized by Nuts'n'Bits.

Nuts'n'Bits brass parts have been attached to the model.



Progress work on the right side of the conversion.

chose to glue the tracks in place before the painting process. The Accurate Armour tracks are very well done and required only minor clean up of flash. The track lengths were soaked in boiling water for about 20 seconds and moulded into place on the running gear. Superglue was applied between the tracks and wheels once the fit was correct. This process took the better part of two hours to accomplish. Alternatively, the tracks can be shaped in place with a hairdryer but this is a considerably longer process.

As I had planned on leaving the front hatches slightly open, it was necessary to build a section of the inside driver's area and turret interior. I used leftover bits from my spare parts box to construct a very rudimentary interior. It was not necessary to superdetail the area, as the viewer's eye would not capture much of the interior.

After a last-minute study of wartime photos, I realized that several of the areas on the turret including the resin 6-pdr. and BESA MG were not very accurate. Moreover, the moulded-on mounting plate to accommodate the 6-pdr. gun was incorrect and the aperture on the front turret needed to be enlarged considerably. I contacted my good friend Daniel Munoz at Nuts'n'Bits who kindly agreed to design and make correct replacements on his lathe and mill. Daniel designed a 6-pdr. Mk.III gun with an accurate mounting plate,

The model has been primed in two coats of Citadel Black Primer.

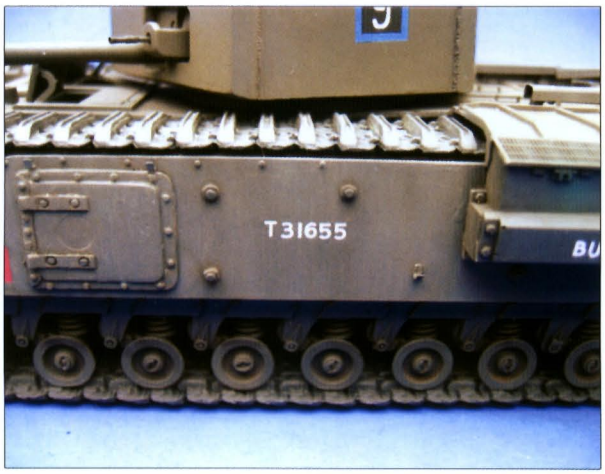
The first light coat of Tamiya Khaki Drab being applied with an airbrush.

The result after two coats of Khaki Drab.

The model received two coats of gloss, and transfers and decals were added.

A localized pin-wash was applied by running a '00' brush along edges and around bolts with oil paints diluted in thinners.

A filter of 95 per cent thinner and 5 per cent Dark Earth Humbrol paint was applied with a large brush.



Close-up view of the model's surface after a pin-wash and filter treatment.

MIG Pigments were used by mixing black and brown powders with Tamiya thinners.

BESA machine guns with a cradle, and also fashioned the exhaust extensions out of brass rods for the rear of the tank. The rear exhaust extensions were affixed to enable tanks to wade onto the beach through deep water.

Once the new brass parts were attached to the kit, the model received a light wash with warm water and a light brushing with soft dish detergent to remove dust and dirt. I allowed the kit to dry overnight in a shoebox. In preparation for the next step, I inserted tissue paper in all hatches and openings to protect these from subsequent paint.

Painting

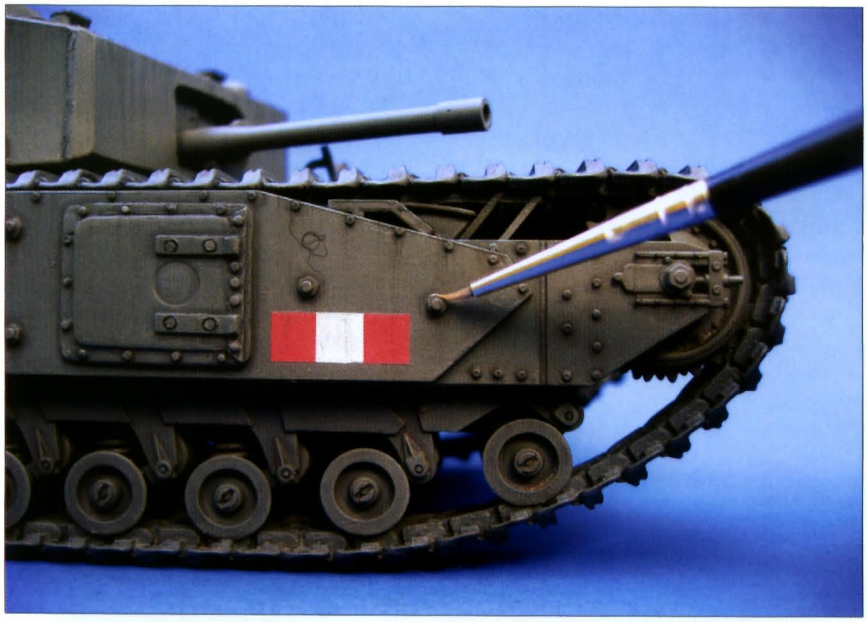
To start the painting process, I primed the whole kit in Citadel Chaos Black from an aerosol can in two light coats. The surface was checked for marks, imperfections and unwanted surface blemishes. For the base painting process, I used Tamiya Khaki Drab thinned with Tamiya thinners in a 3:2 ratio and the mix was sprayed lightly to all parts with an Iwata HP-B airbrush at about 20 DPI. It is important to start airbrushing off the model when depressing the trigger to ensure an even and smooth flow of paint across the vehicle. I then re-sprayed the kit a second time to ensure that all surface areas received a light application of the paint.

The BESA machine gun and cradle were scratchbuilt by Daniel Munoz.

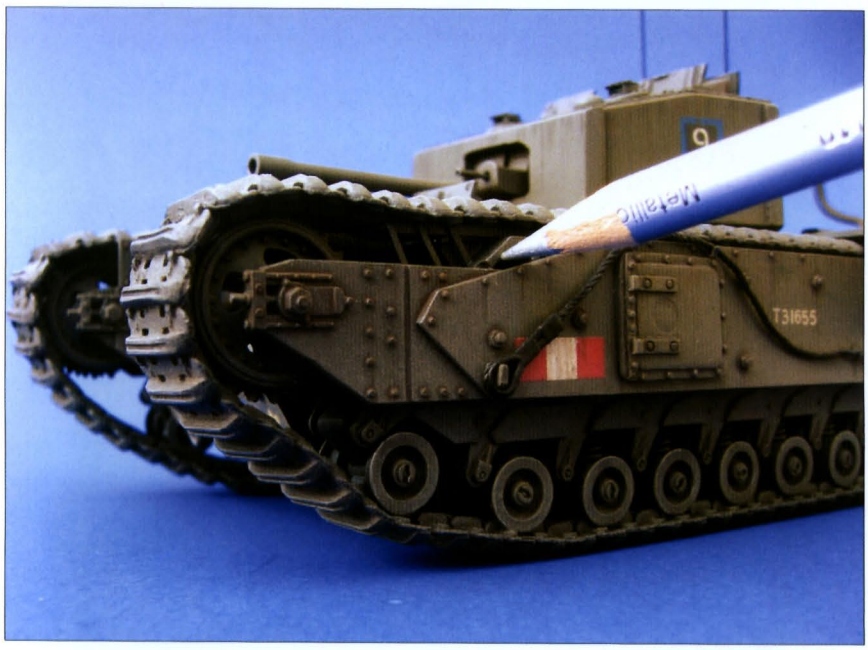
Once the base paint was thoroughly dry, I sprayed two light coats of Model Master Gloss onto the whole kit. The gloss application would greatly assist in protecting the base coat from the weathering process and also aid in the application of decals.

Once the two coats of gloss had completely dried (24 hours), I moved on to the markings. I used homemade decals customized by fellow modeller Marc Bourque and applied these carefully, following photo references. The decals were applied using MicroSet and MicroSol to ensure that the decals adhered to the surface firmly. I also applied Archer Dry Transfers for the WD (War Department) numbers and the name of the tank: 'Buttercup'. Buttercup was commanded by Sgt. J.D. Morrison from B squadron 9th Troop and carried the number T31655. It was one of several Churchill tanks left stranded after failing to navigate its way through roadblocks off the beach.

As soon as the decals were dry, I applied a quick squirt of gloss over the decals and transfers to further ensure these were fully sealed and protected. Prior to the weathering process, I opted to paint the tracks. My compressor was turned down to 10 psi and a light spray of Tamiya Dark Grey was sprayed onto the tracks. This can be achieved without affecting the Khaki Green base colour



The pigment and thinners mixture was applied around rivets, bolts and along seams. Note the use of pigments to make subtle vertical 'rain marks' from the rivets.



A 'steel' coloured pencil was run along various edges to show subtle abrasion.

of the tank by masking off as much of the surrounding base colour with small sheets of notepaper. All of the hard-to-reach areas of the tracks – particularly between the road wheels – were painted with the same Dark Grey but heavily diluted in Tamiya thinners and applied using an '0' brush.

Weathering

I am always interested in reading and trying new weathering techniques. The degree of weathering is, by-and-large, dictated by the location of the vehicle, conditions, climate and how long the vehicle has been in service.

Churchills at Dieppe were quite new and heavy wear and surface weathering would need to be kept to a minimum. It was important to restrain the weathering process as much as possible.

The exhaust extension was primed in black, and MIG pigments mixed with thinners were applied to create a textured rusted surface.

BELOW AND OPPOSITE The completed model.

With the tank base-painted, fully marked and sealed with gloss, I started with a 'pin-wash' which is essentially a carefully placed local wash rather than an overall wash. To start, I sprayed a thin coat of pure Testor's thinners onto the whole model to help break up the surface tension. I mixed Rembrandt Sepia (20 per cent), Raw Umber (10 per cent) and Humbrol thinners (70 per cent) and began the task of touching the tip of a liner brush along seam lines, around bolts and grab handles. I allowed this to dry overnight.

The next weathering step was the 'filter' system. This is an effective technique that helps break up the monotony of a single-tone paint job. I mixed 5 per cent Humbrol Dark Earth with 95 per cent Humbrol thinners and applied this with a wide brush in a vertical motion on the tank and tracks. I repeated the same technique using Humbrol Stone Yellow and followed this again with Humbrol Dark Yellow – each time ensuring the previous filter had thoroughly dried. When applying this technique, it is critical to respect the paint to thinner ratio.

The next step was the application of some subtle drybrushing. I dipped my '00' brush in some Humbrol 150, rubbed the brush hairs onto a rag until the brush hairs were devoid of paint and proceeded to lightly brush the surface of the kit in a whisking, downward motion. If it looks as though the paint is not adhering, then the amount of paint on the brush is adequate. This was left to dry for 24 hours.


9
BUTTERCUP
T.31655


9
T.31655
BUTTERCUP

ABOVE A composite image of the Churchill Mk.III on the Dieppe beach. (Ulf Anderson)

At this point, I would typically add rust marks, metal chips, and mud, in this order. However, keeping in mind that the tank I was depicting had seen little combat prior to being stranded on the beach by its own sheer weight, I confined my weathering to some subtle MIG pigments mixed with Tamiya thinners. This mix was applied around bolts and rivets and I also used a 'Steel' coloured pencil on selected parts of high-wear edges of the tank. The exhaust extension did receive a bit more pigment weathering with a heavy dose of black and brown pigments diluted in Tamiya thinners. (See also the *Tips and tricks* chapter for more details on 'painting and weathering order'.)

Churchill tanks that came ashore at Dieppe were navigated through a certain depth of water before reaching the beach. To depict the effect of water tidemarks, I airbrushed the lower half of the model with a restrained amount of Tamiya Buff mixed with Tamiya thinner in a 1:4 ratio. It is really important to apply this heavily diluted Buff treatment in a work area with plenty of natural light to ensure that the application is not too heavy. It can be very difficult to reverse if overdone. However, if it is accidentally overdone, several light vertical drybrushing treatments with an enamel colour equivalent to the base will greatly reduce the effect.

Conclusion

The Churchill Mk.III was not a difficult conversion. With some added modifications to this project, one could also depict an earlier Churchill variant (a Dieppe Mk.I or Mk.II) and for those looking to go the extra step, the Dieppe 'Oke' flame-thrower and the TLC Carpet-Laying Device could prove to be equally interesting and unique challenges.

Churchill Crocodile, Germany 1945

Subject:	*Churchill Crocodile, Germany 1945*
Modeller:	*Dinesh Ned*
Skill level:	*Advanced*
Base kit:	*Tamiya Crocodile*
Scale:	*1/35*
Additional detailing sets used:	*See text*

An appeaser is one who feeds a crocodile – hoping it will eat him last.
Winston Churchill

Production of the Mk.VII began in late 1943, and incorporated several major changes as a result of experience gained from producing and fielding earlier variants. Although designated as a new tank by the War Office due to its many improvements, there is actually very little to readily identify the Mk.VII from earlier marks, aside from the turret shape, gun and various rounded apertures. The most telling improvement was in armour protection. The Royal Armoured Corps fielded a variety of Churchill-based conversions, especially engineering and specialist fighting vehicles. One example of the latter was the Churchill Crocodile, perhaps the most noteworthy and successful flame-throwing tank of World War II.

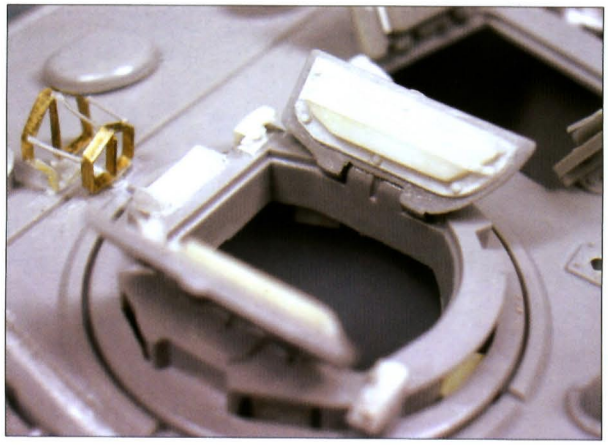
The Churchill Crocodile was used in conjunction with a specially designed trailer that contained five tanks of incendiary fuel along with its nitrogen propellant. The trailer was hooked up to the tank via a specially designed coupling device that had a universal joint. This device also had a quick release trigger mechanism, allowing the trailer to be ditched in case of fire, or when it ran out of fuel.

Tamiya released the standard version of the Mk.VII, and aside from an extra sprue containing a crew in summer dress, a French civilian, a cart and some bottles, the rest of the kit remained unchanged from the older Crocodile version without the trailer and other relevant parts for the flame-throwing tank.

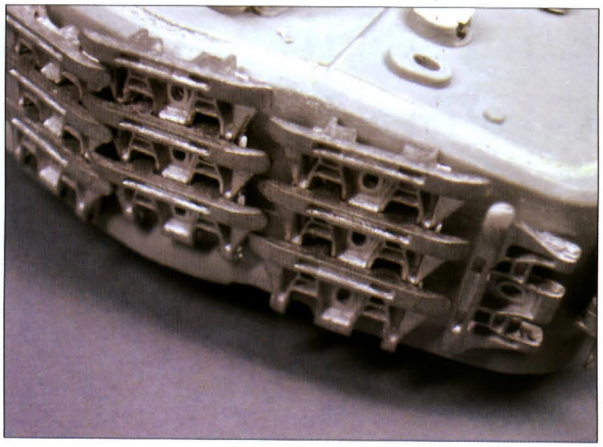
Building the Crocodile

In planning this project, Dinesh Ned decided the best approach would be to work with sub-assemblies, namely the trailer, the turret, and the hull, tackling these in ascending order of difficulty. He also opted not to use any after-market photo-etch for this project, but would scratch build any required parts. The only after-market product used was a set of Churchill tracks in white metal by Friulmodelismo. Most of the references used for this project came from the *Tamiya News* magazine (Photo Album No.3) dedicated to the Churchill, and David Pentland's book *Mr. Churchill's Tank – The British Infantry Tank Mark IV*.

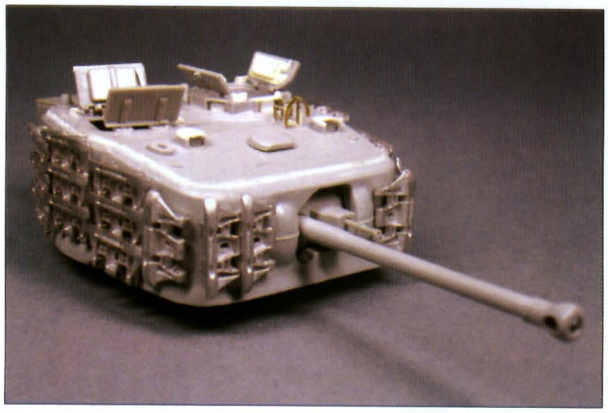
Dinesh started with the trailer by reworking the stowage loops for the thills on either side of the trailer body. Thills were long, steel shafts that facilitated the mobility of the trailer by hand whenever necessary. These were fashioned from brass sheet bent round dowel of a suitable diameter. When used, the thills were fitted into tube-like brackets mounted on the four corners of the trailer. After being slotted in, these were kept in place by retaining pins. He also replicated the pins with fine fuse wire, and attached these to the trailer with fine photo-etched



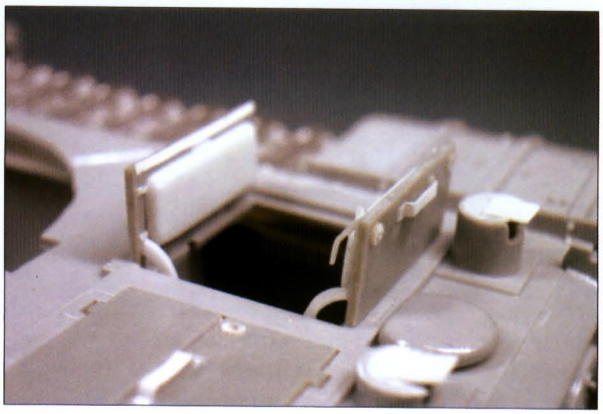
The commander's cupola showing scratch-built details such as the hatch cover stoppers, interior hatch detail, periscopes and the delicate gunsight, made from brass and styrene.



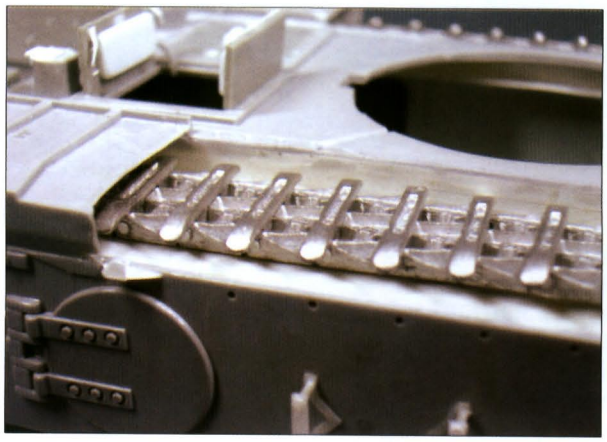
Spare track appliqué for the turret came from extras provided in the Friulmodelismo set.



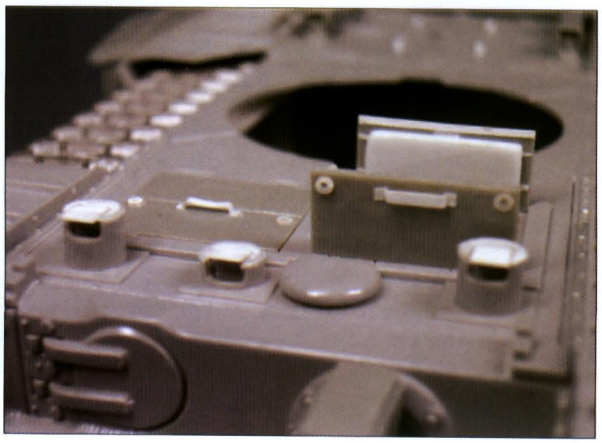
Front view of the completed turret with all necessary details added.



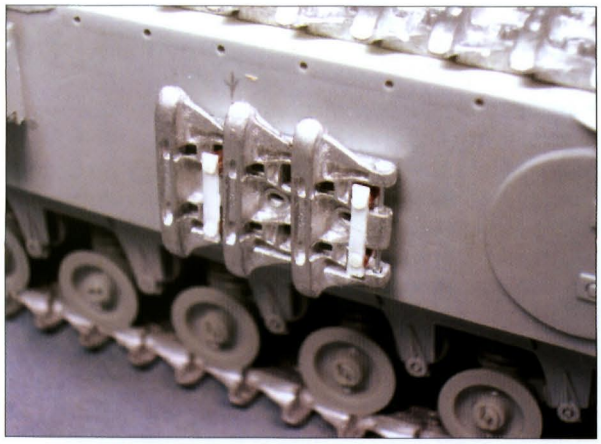
The radio operator's hatch, with scratch-built interior details such as the headpads, latches and swingarms.



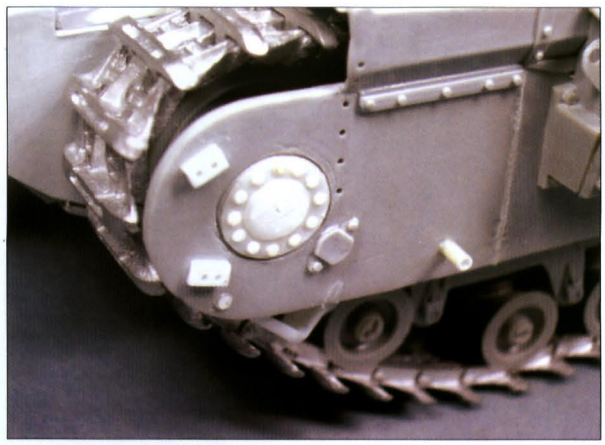
The track mudguards were partially removed, requiring a lot of reworking, especially to rebuild the sponson floor and walls, bolt holes and thinning the adjacent mudguards appropriately.



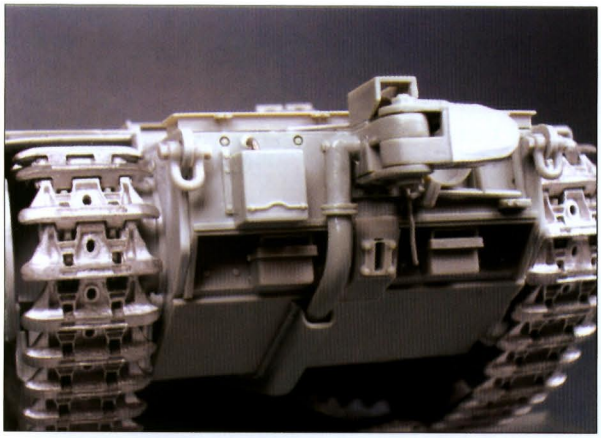
Front view of open radio operator's hatch (note added keyholes).



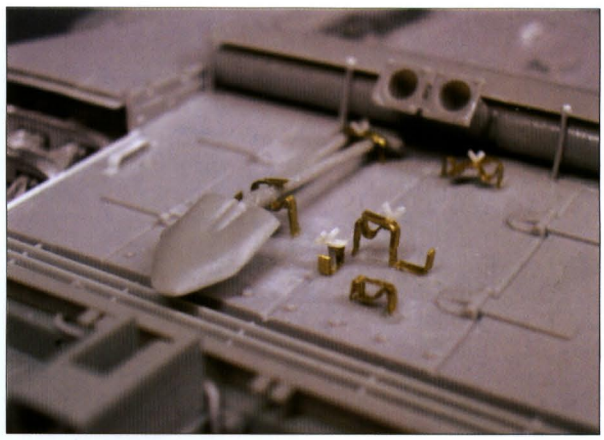
The generous Friulmodelismo track set included sufficient extra links to use as spare track, shown here with scratch-built holders



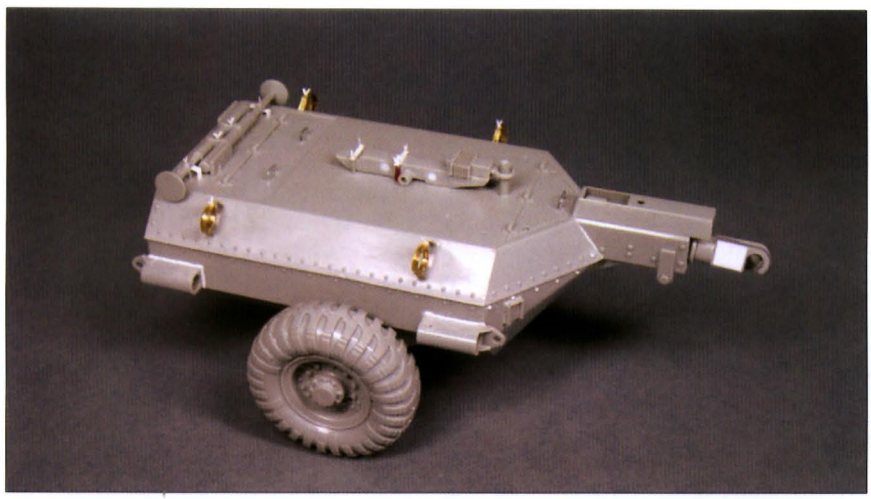
Removing the rear mud flaps required rebuilding much of the detail in that area, including the flap mounting lugs, drive sprocket axle housing, tow-cable holders and the barely visible mud scraper.



The rear plate of the Tamiya set looks very busy, and is good as it comes. Only a large moulding dimple on the tow coupling head needed to be filled.



Figuring out the tool holders proved difficult until Dinesh found some useful reference online.



The trailer, almost complete. Only the photo-etch chains for the towing-pintle locking pins on the sides need to be added.

chain from Aber. Straps and holders for the auxiliary hauling hook (for towing by lorry) and support struts were also reworked using styrene strip and rod and with home-made wing nuts.

Grab handles were also made from fine fuse wire, and the restraining bar for the rear access hatch was detailed with bolts punched from styrene and stretched sprue. Welding beads were simulated with thin strips of styrene softened with plastic cement, allowed to semi dry, and then textured with a sharp blade.

Although Tamiya provides a fairly decent turret, it suffers from a lack of detail. The hatches lack sufficient internal definition, and so missing details were added such as latches, hatch clamps, leather head pads and their restraining straps, key locks, and in the case of the commander's cupola some periscopes. All these were scratch-built using styrene strip, plastic rod and some bolts punched from a Waldron sub-miniature punch and die set, which can produce some really exquisite tiny rivets and bolts.

The commander's sighting vane was complicated and was carefully constructed from photos and drawings, using brass strip, styrene strip and rod. Due to its fragile nature, this was left off until the whole turret was almost completely built.

The Churchill also had periscopes that were set in round armoured mounts. Tamiya provide these, but these lack the thin sheet metal covers and flaps. These were made from styrene discs punched from a larger punch and die set. A square of plastic was then cut out on one side, and a folding flap added. In reality, these flaps would be pushed up if the periscope were raised for viewing. A collar made of thin styrene was also added round the top edge of the periscopes.

The latch and latch eye of the turret basket, as well as straps and mounts for the fire extinguishers and the signal flag stowage tube, were all made from styrene strip. The latches for the flag tube covers were made from fuse wire and superglued on. For the uniquely British antenna mount with the circular guard, Dinesh cut a thin slice from a hollow tube, and carefully filed these very thinly and added the supports from styrene sheet. When it was all in place, a light coat of liquid glue was applied for added strength. The bulges on either side of the main gun aperture lack the prominent weld seam, so these were fashioned with styrene paper.

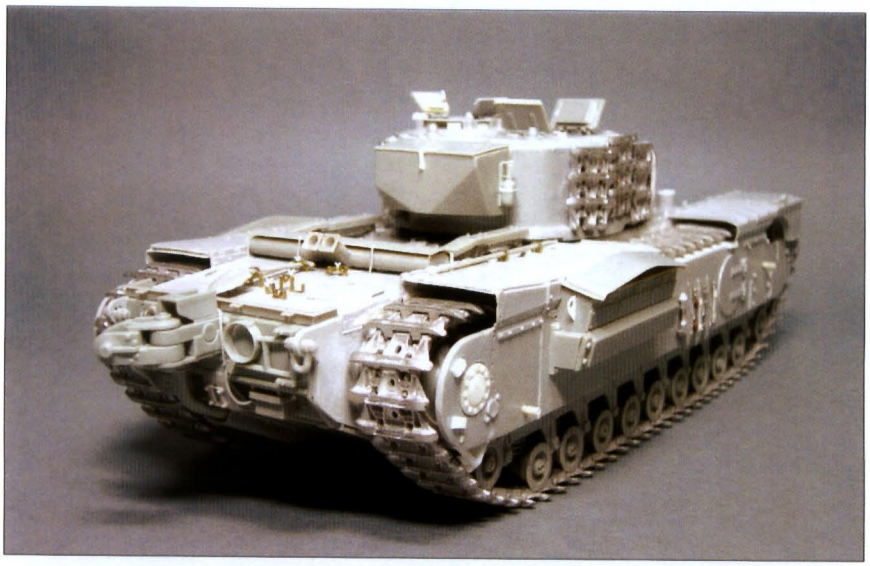
Finally, the entire turret received a cast texture with a copious application of Tamiya plastic glue, but using the thick, slow-drying type. After allowing it to sit for a few minutes, texture was created with an old stiff brush by using stabbing and later stippling actions.

For the main sections of the hull, Dinesh started by removing some of the track guards and thinning down the remaining fender sections. The pannier roof was rebuilt and the gaps on the hull sides were plugged. Holes were also drilled for the missing fender attachment bolts. Removing the rear mud flaps was challenging as these are moulded integrally with the hull top piece. In reality, this flap partially sits over the drive sprocket axle mount, and removing it requires rebuilding this entire area, including the mounting lugs, a small access hatch and drilling in the bolt holes where the flap would have been attached.

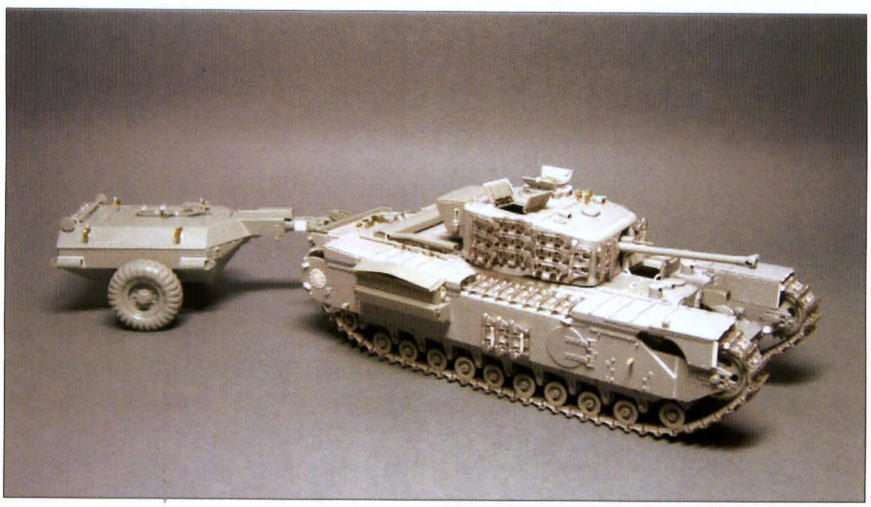
Churchills have a mud scraper attached just below the drive sprocket on either side, and this is bolted to both sides of the pannier walls by means of two long arms. These were scratch-built in sheet styrene, using the drawings in Tamiya's Churchill Photo Album. Restraining springs for them were fashioned with fuse wire wound around a pin and super-glued in place. Other detail work included making lifting lugs for the air outlet boxes, fabricating spare track holders, as well as new tow cable anchors.

With both the front and rear mud flaps removed, styrene strips were used to reconstruct the mounting guides, and the inner face of the track guards received dozens of rivets, which were positioned using pictorial references. The inner face of the front track guards in particular needs a lot of attention, as this is particularly noticeable. Two rotating tow shackle mounts are also needed on

Front view of the nearly complete vehicle. Even without the hull appliqué armour, one can readily see the impressive proportions and bulk of this vehicle.



Rear view of the nearly complete vehicle.



View of the assembled, detailed model with trailer.

the inner face of the track guards, positioned just below the idler mount. These were made from styrene stock.

The plastic hull rear plate is well done and requires little work apart from adding two cables, one running into the communication box and another for the smoke-grenade holders. All welding seams were replicated using the styrene paper method and grab handles on crew and engine hatches were cut out and replaced with new ones made from styrene strip. After the headlights were attached, the two small width indicator lights mounted on the track guards were made from leftover sprue ends of suitable size. These were cleaned up, drilled and attached to scratch-built bases. Wiring was made from very thin stretched sprue. It's important to ensure that the sprue is of consistent diameter. The machine gunner's hatch was left open, and the periscope guard caps were scratch-built in a similar fashion to the turret components mentioned earlier.

The tracks were then constructed. The Friul offerings come with tiny track pin holes already pre-drilled, and wire cut to an appropriate length of wire is inserted into the hole with a small drop of superglue at the mouth of the hole to hold the pin in place. A bolt head of appropriate size was added over the pin hole.

Late-war Churchills were almost always geared with spare track appliqué armour. The Friul set was generous in content, and there were sufficient spare tracks to fill one side pannier holder and almost completely cover the turret front and sides. These were generally welded on in real life.

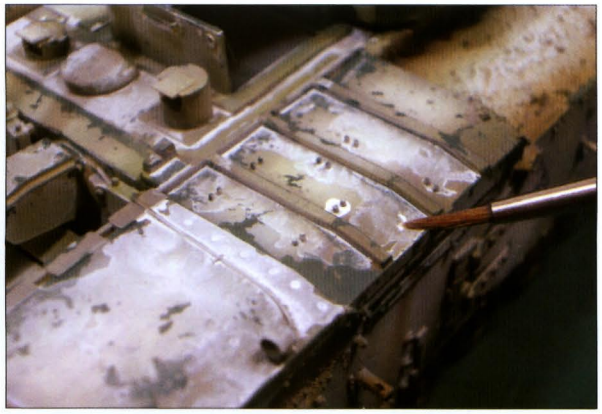
Painting and weathering

In preparation for the painting process, all metal parts were coated with Gunze metal primer to prevent oxidisation, as well as to assist in paint adhesion. The whole collection of sub-assemblies and stowage was then primed with superfine Gunze White Primer 1000, and set aside to dry.

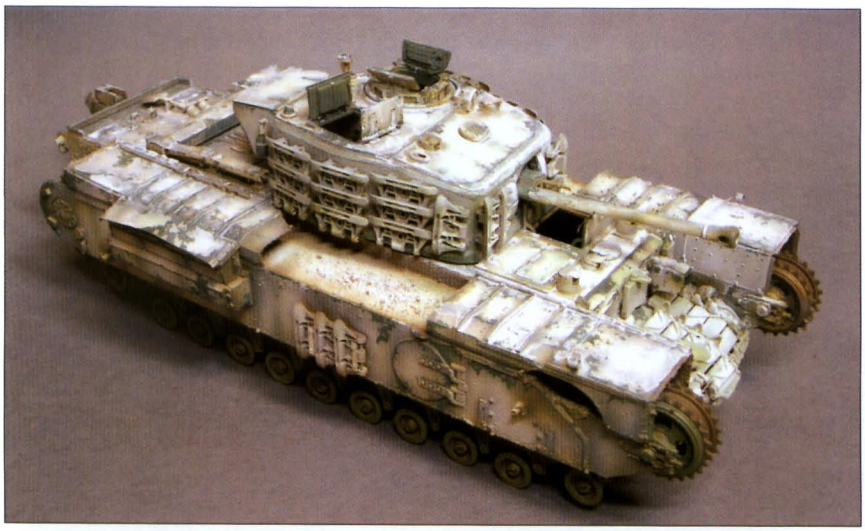
The painting process was started by priming the model using a solid white coat. This was done to attempt a winter whitewash, depicting a vehicle in North-West Europe during the final winter of the war. Dinesh spray-painted almost exclusively with Gunze Sangyo 'Mr. Color', which is a lacquer-based paint, because it contains extremely fine pigments, is vibrant, dries fast, and is extremely tenacious. Also, it is very resistant to the abuse it will receive during the weathering stages.

The tank was pre-painted in white with random applications of Dark Earth.

Dinesh added hard edges in acrylic green paint to the surface to simulate peeling whitewash.

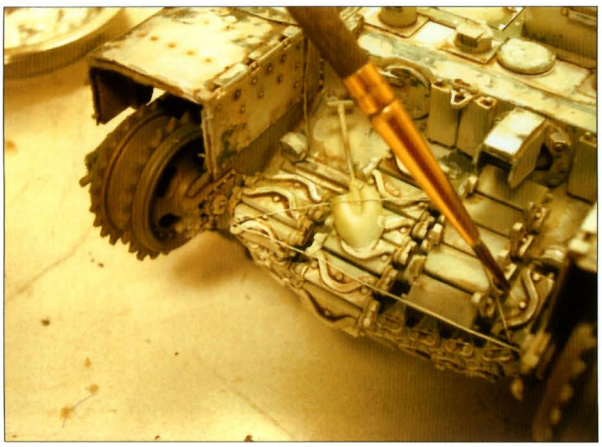


An application of the winter whitewash, comprising several translucent layers of thinned paint to slowly build up opacity in selected areas.



Overview of the model before the filter and wash process.

An overall filter of thinned oil paints was applied to all surfaces.



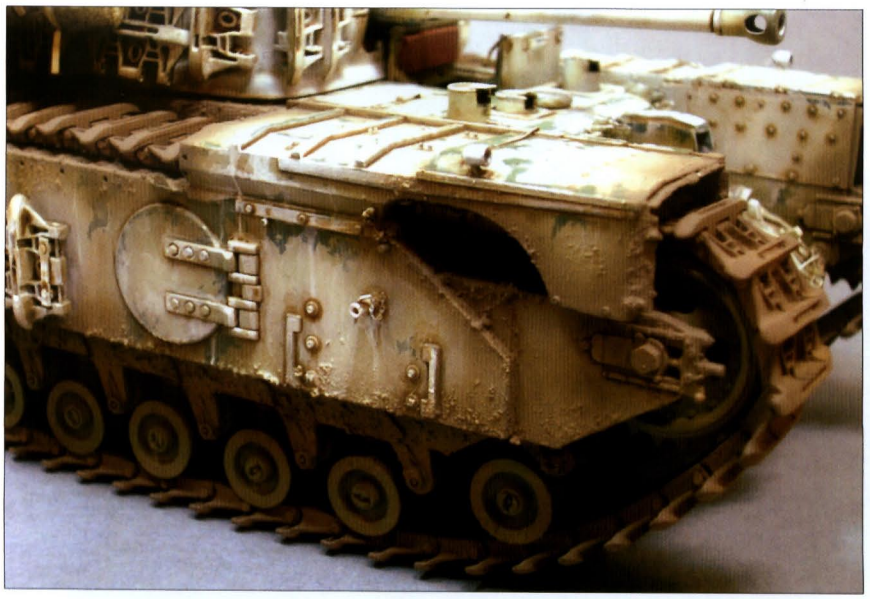
Raw Umber oil filters were added along all seams and crevices.

Heavily diluted white acrylic paint was added to selected areas.

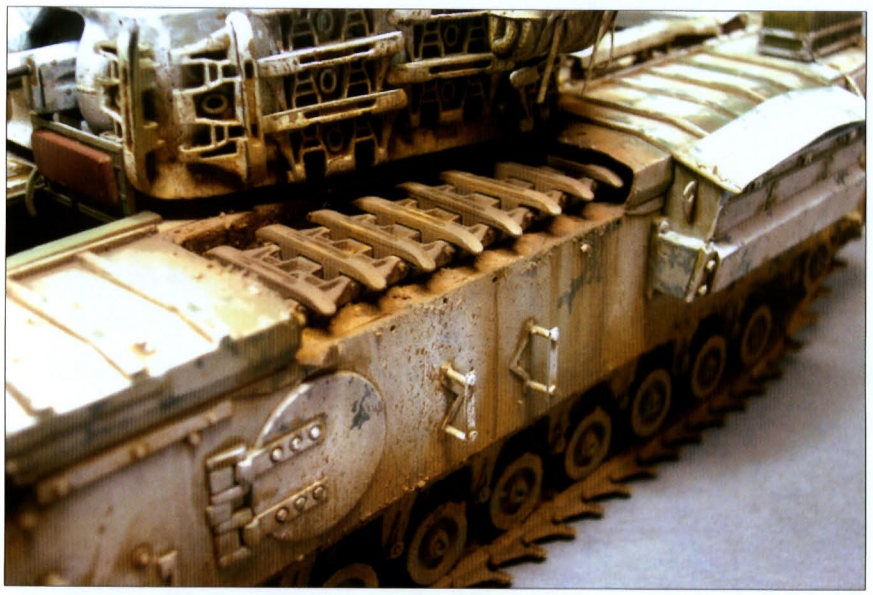
The next step involved a dirty brown paint mixture being sprayed to all of the edges and corners of the tank, focusing primarily on flat areas where water might collect, and also the parts of vertical areas where streaking was likely to occur. Once this step was completed, a mix of diluted bronze-green colour was sprayed onto the same pre-shaded areas, only more lightly, so that some depth was created.

A shade of green using Vallejo acrylic colours was heavily diluted (ratio 1:5 paint to water) and applied in layers to build up opacity. For this step, a quality sable brush is essential and the diluted paint should be restricted to corners and areas of extreme wear or abrasion. This process creates the illusion of winter whitewash that has peeled off, leaving patches of the

Right-side view of the tank in progress.



A close-up view of the side hull.

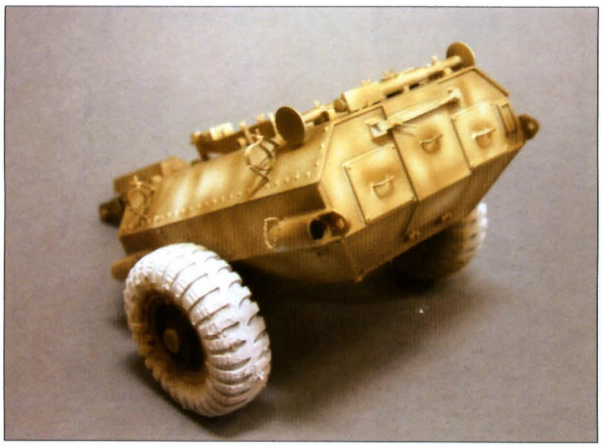


Note the splatter effect on the side hull.

original green visible underneath. This process was repeated but with off-white to denote areas where whitewash may have collected, or was applied a little thicker than in other areas. Dinesh also painted in a faint white line between the edges where the green and whitewash meet to create an impression of a difference in depth.

Dinesh is a true master of the weathering process and in order to create a realistic looking vehicle, he used subtle tonal variations by making very thin filters using browns, khakis, blue, red and green oil paint. These are applied with a thinner soaked brush to create different, subtle, yet noticeable nuances in tone.

The next step was to apply pin washes starting with Raw Umber in recesses, edges and other areas of dark shadow. This process was repeated two or three times, always ensuring unwanted excess thinner and stains were removed using another clean brush lightly soaked with distilled turpentine and a clean cotton bud.



The trailer received the same painting and weathering treatment as the tank.

Adding a brownish mix to create layers and vary the tones.

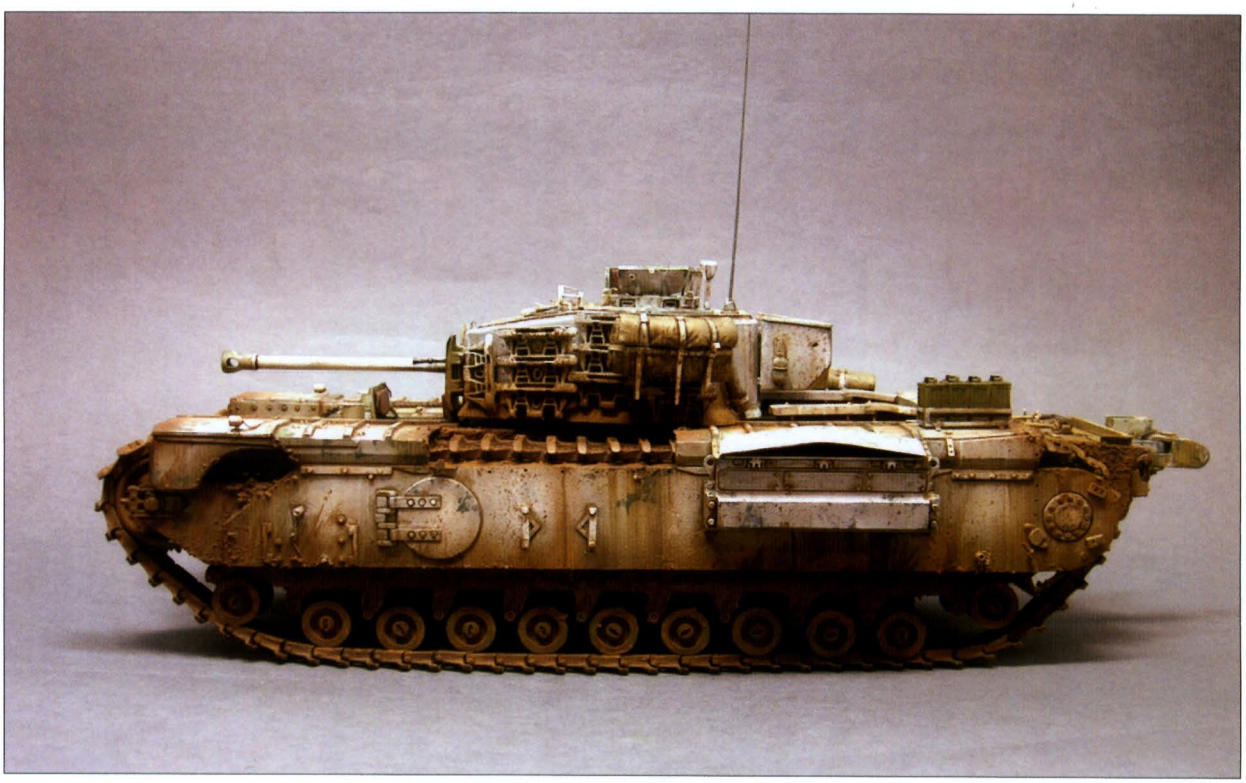
Vallejo acrylic paint was added to the surface to denote the original paint of the tank under the whitewash.

The trailer before the filter and pin-wash treatment.

The completed trailer.

ABOVE The completed tank.

BELOW Note the mud effect on the rear and sides, which was achieved with pastels.



ABOVE **A side view of the Crocodile.**

BELOW **The completed model.**

Dinesh then proceeded to paint the stowage and other items such as tools, MG barrels, straps and the exhaust mufflers with Vallejo acrylics. The stowage items received filters and washes, and when dry, these were attached to the tank, and more washes were applied to create a unified look. Highlights and washes can be applied and reapplied at this stage until the desired look is achieved.

The entire substructure and tracks were then sprayed in a dirty muddy brown made by mixing Tamiya acrylic Dark Earth with Sand Brown and Black. Plain Dark Earth was sprayed on highlight areas, and finally Dark Earth mixed with Buff was sprayed selectively where mud might have dried. The tracks were then installed, and glued in place permanently.

The final stage of the weathering process involved the application of pastel chalks using Rembrandt pastels. First, a mixture of pastel yellow ochre, clay earth and brown was mixed up with Tamiya acrylic thinner, forming a paste, and this was carefully applied to nooks, crannies and recesses for that super dark, wet, muddy look. Another similar mixture, but of a lighter shade was applied to raised areas and where mud might have started drying. Finally, a thin, watery paste was mixed up, and a stiff bristled brush was then lightly soaked in it. This was then stroked with a finger, causing thousands of tiny droplets to spray onto the model. This needs to be done with caution and restraint. In real-life the trailer, which was located behind the tracks, would have received considerable throw-back of mud and spoil, and this was achieved by applying the same weathering treatment but in heavier doses.

As a last step, pure dry pastel powder was brushed into recesses on the upper hull, dabbed onto the tools and on areas where the crew might walk about. This last step completes the process while making sure that the white-wash was not obliterated. Again, these processes can be repeated until the desired look is achieved.

A montage of the Churchill Crocodile in Germany, 1945. (Ulf Andersson)

Churchill AVRE with SBG, 79th Armoured Division, France, 1944

Subject:	*Churchill AVRE with Standard Box Girder bridge, 79th Armoured Division, France, 1944*
Modeller:	*Mark Cooper*
Skill level:	*Master*
Base kit:	*Tamiya Churchill*
Scale:	*1/35*
Additional detailing sets used:	*Resicast AVRE conversion* *Eduard photoetch* *Evergreen styrene* *Grandt Line and Tichy Rivets* *Brass strip* *Bass wood* *Accurate Armour Churchill Tracks* *Archer Fine Transfers 79th Armour Div* *Karaya tow cables*

Many Churchill AVREs were fitted to carry the Standard Box Girder (SBG) bridge. The bridge weighted in at 4.8 tons and the bridging device could be lowered to span gaps as much as 30ft. wide, and withstand loads of up to 40 tons. The AVRE SBG was first deployed in Normandy in June 1944.

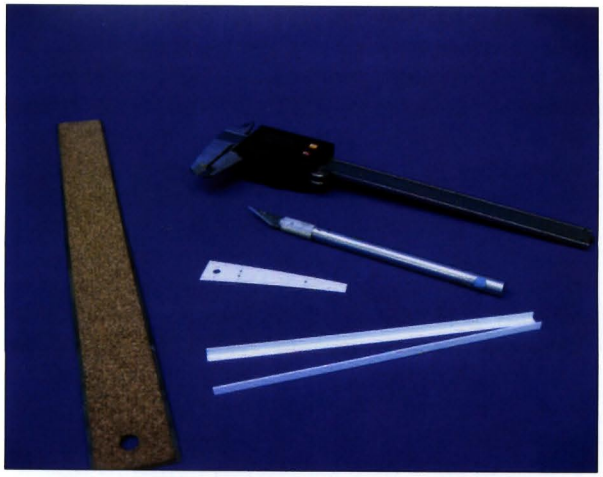
For this challenging project, Mark Cooper undertook considerable research, and gathered as much information and reference material through the internet and from Bovington Tank Museum. David Fletcher, at the Tank Museum, was particularly helpful in providing a wealth of information in the form of Plan Packs (a collection of official drawings, stowage sketches, etc.) covering the early Churchill, AVRE and SBG as well as a number of photographs. Other useful materials included Osprey's New Vanguard 4: *Churchill Infantry Tank* and Tamiya's *Photo Album* on the Churchill.

Once all of the reference material had been collected, a number of hours were spent examining the Tamiya Churchill Mk.VII to determine necessary modifications and alterations to backdate the Churchill Mk.VII to an earlier variant Churchill IV AVRE.

The next stage of the project was the planning phase to determine what materials and tools were required in addition to a new set of instructions. For the tank itself, it was necessary to modify the kit instructions. For the SBG, a set of 1/35th-scale plans had to be drawn out to scale to facilitate the process. The SBG plans were based on Geoffrey Futter's 1/76th drawings with additional wartime photos as reference to ensure accuracy in the construction process.

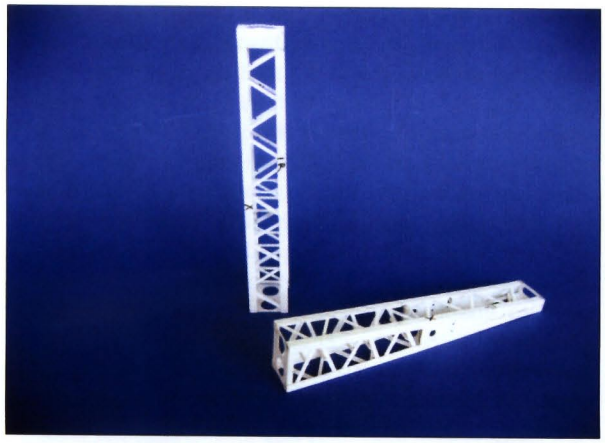
Building the SBG

Although an SBG kit does exist in resin kit form by Resicast, Mark opted to scratch-build the SBG from sheet styrene. For this comprehensive scratch-build, several accessories were required: the Chopper, a photo-etch bender, a Historex Hex Punch and Die set, Waldron's Sub Miniature Punch and Die set, and a Dremel tool.

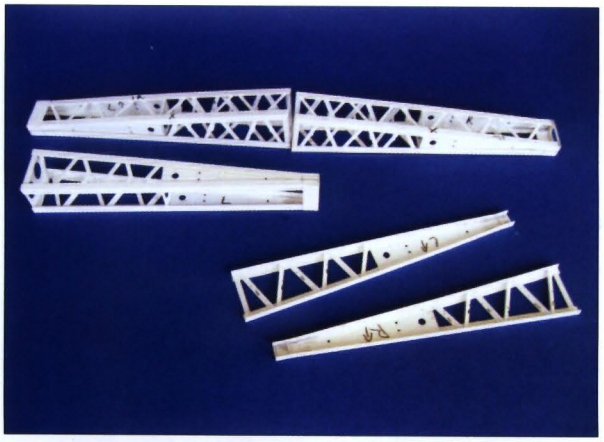


A digital caliper was used to ensure correct measurements.

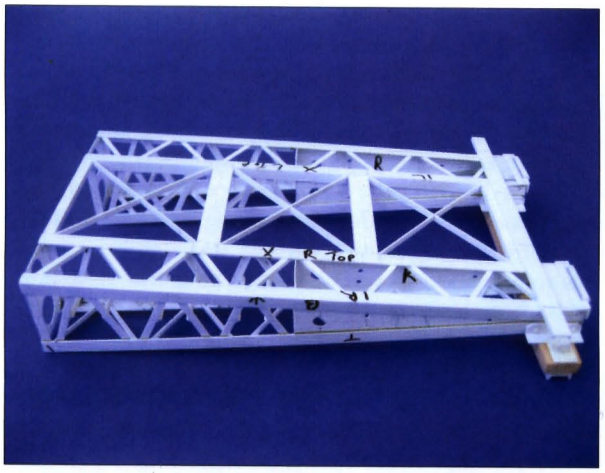
One of the support brackets constructed from Evergreen sheet styrene.



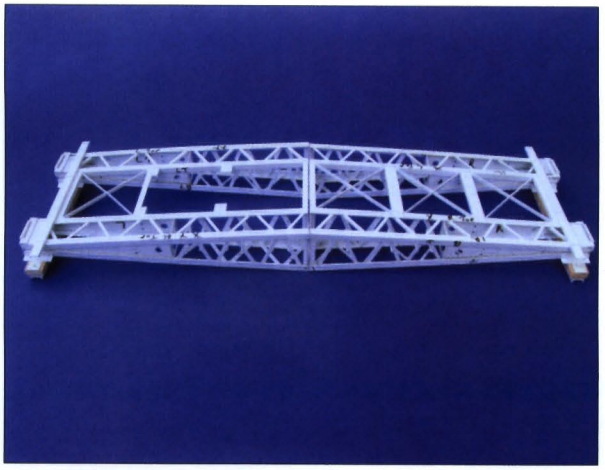
Different lengths and thickness of styrene were used to build the supporting brackets.



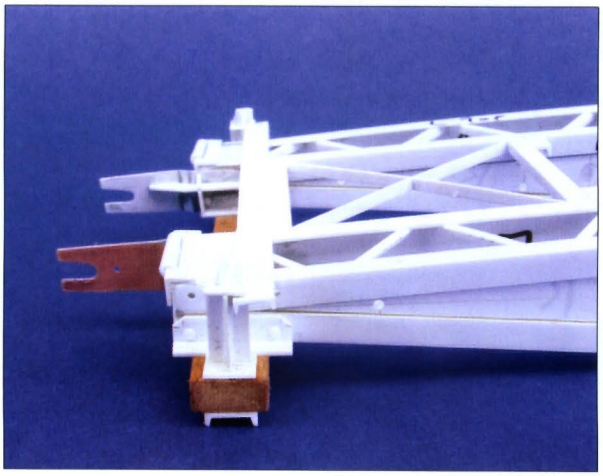
The various parts were glued together with liquid glue to ensure a solid build.



One completed side of the SBG structure.

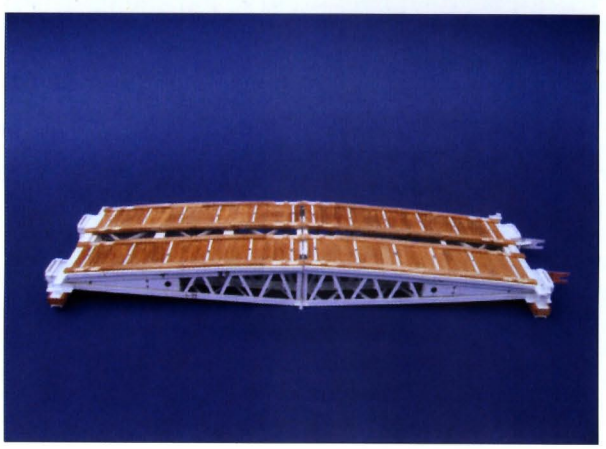


The brackets and braces glued together.



Support blocks (the bankseat) were added to the SBG ends using bass wood; copper braces were also added to help secure the SBG to the tank.

The decking was fashioned from bass wood cut to size and length, and rivets were added using a punch and die set.



A 'test-run' to ensure the SBG is a good fit.

After two months of research and gathering all of the information and determining precise measurements, the process of building the SBG began. The first step was the framing. The SBG frame is composed entirely of sheet, angle and I-beam styrene. Although the construction of the SBG was a time-consuming process, it was not difficult due in part to the 1/35th-scale plans created during the planning phase. Construction of the SBG included cutting the main-frame members (angle styrene) to length and gluing these together at one end. Once the glue had set, an incision was made on the outside face allowing the frame members to be bent and thus creating the V-shape. With the main-frame members completed, these were laid out on top of the plans and girders/supports added. Using this method, Mark was able to ensure the correct placement and angle of the cross bracing.

Once the eight main-frame pieces were completed, these were joined together to create the four ramps of the SBG. Again, the bracing was added using the scale plans to ensure correct placement and alignment. It is critical to ensure that the framed members be kept square while the work is completed.

Joining the ramps together to form each half of the SBG required the construction of a small jig to keep everything aligned. The ramps were joined together using an assortment of styrene channels and left to dry. Once the glue had set, the cross-bracing and bankseat were added. Being made of bass wood, the bankseat was affixed with epoxy glue and pinned in place to ensure that it did not break off during the remainder of the project.

The SBG attaches to the AVRE using a simple set of forks and gravity. During the initial planning stage, several different methods had been considered to make a set of forks that could not only hold the SBG on its own weight but also survive any bumps and bangs that models typically experience when being transported. Given the width and shape of the forks, a sheet of .01in. copper was used and combined with a sheet of .01in. styrene glued to the inside. The copper was cut and shaped with a Dremel motor tool and then bent to the correct shape. This provided the necessary reinforcement for the forks while the layer of styrene made it very easy to add the additional details.

It was decided early in the project to use actual wood as opposed to plastic for the decking structure. Initially, Mark tried using balsawood but was not happy with the results and opted to use bass wood. The bass wood had a finer grain and was a little denser, which resulted in a huge improvement over the initial attempt. The assembly of the decking was very straightforward. Bass wood was cut to the desired length using The Chopper and then glued together using standard wood glue. The main problem encountered when using wood and styrene was keeping everything together. To solve this problem, holes were drilled through the decking and

into the framework and styrene rod was inserted. This prevented any further separation and helped to reinforce the SBG. The additional details, such as the bolts, were also added using embedded pieces of styrene, which allowed these to be glued in place using model cement.

Construction of the AVRE

To backdate the Tamiya Churchill from a Mk.VII to a Mk.IV, the first step was constructing a new front hull using sheet styrene with the thickness and angles based on drawings in the Tank Museum Plan Pack. The driver's vision port was the most challenging aspect of the front hull given the amount of detail. However, with an extensive selection of styrene, and punch and die sets, the task was completed. A new front hull was also built using sheet styrene based on the plan pack drawings. Before assembling the upper and lower hull, lead tire weights were added to help counter balance the model once the SBG was put in place.

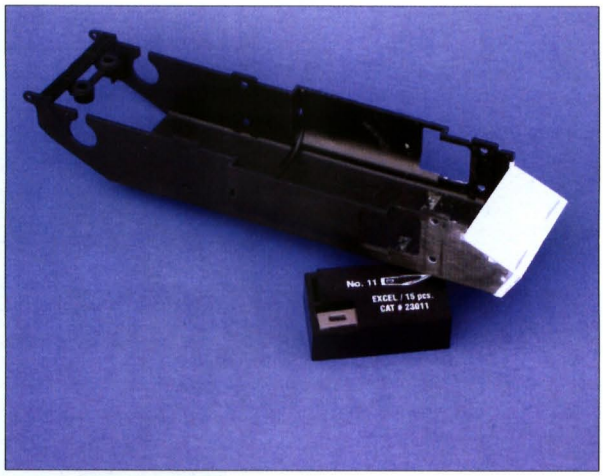
One of the more visible differences between the late and early Churchills is the side hull. The first step was to shave off the existing details and reshape the front of the hull and fenders. This was accomplished by making a template out of sheet styrene and tracing the design on the side of the hull. The excess plastic was cut away using a razor saw. The next step was the construction of new side access hatches using sheet and strip styrene. The hatches were based on photos of the Aberdeen Mk.III and the Tank Museum plan packs.

The track skid rails are generally hard to see on Churchills with full-length upper hull fenders. Partial rails were made using angle and strip styrene with rivets made using a punch and die set. The ends of the supports were tacked in place, and once the glue had set, these were then bent to the desired angle. Once the rails were correctly aligned, these were glued in place with epoxy glue.

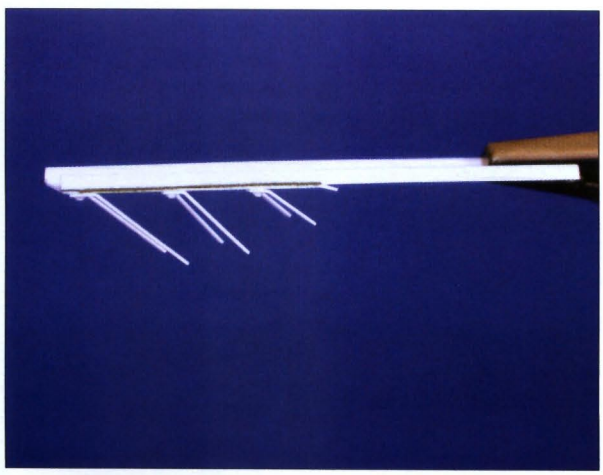
The majority of the detail work for the AVRE involved adding hundreds of rivets. Most of the rivets were created using punch and die sets but some after-market rivets were all used from the Grandt Line series. The placement of the rivets was based on plan-pack drawings and assorted photos of early Churchills. To help ensure the correct placement of rivets, the precise locations were marked out in pencil and rivets positioned using an X-acto blade.

The spare track is from the Accurate Armour range and once the resin spare tracks had been cleaned, these were attached to the hull by supergluing a piece of styrene rod to the track and drilling a hole in the hull. This allowed the tracks to be painted separately from the tank.

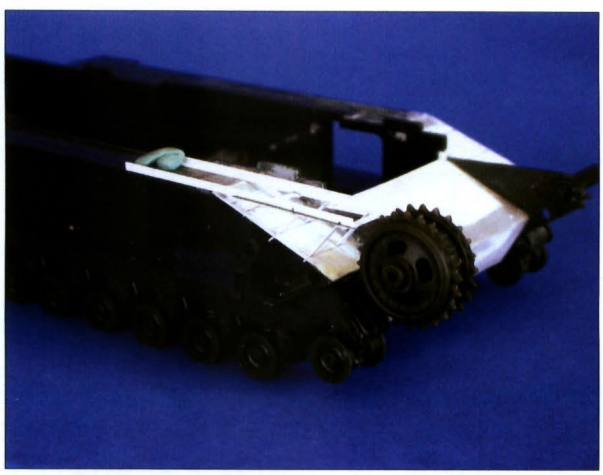
Initially the mud chutes were an area of concern given their delicate design. However, additional strength was added by using thicker styrene thinned down on the edges, which allowed these to be securely fastened to the hull.



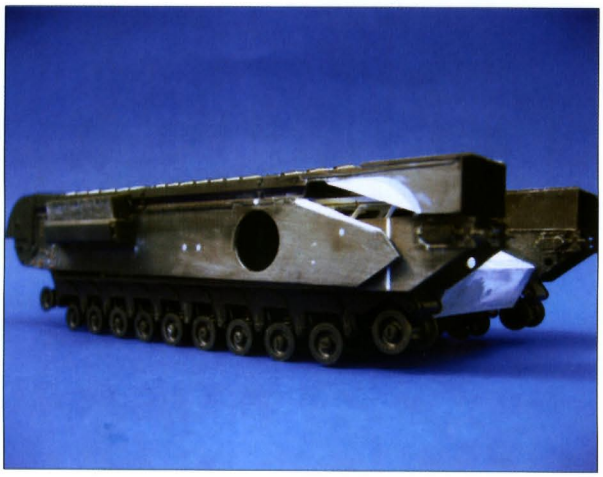
The front nose of the Tamiya kit was discarded and a new one was built using sheet styrene.



The track supports fashioned from sheet styrene.



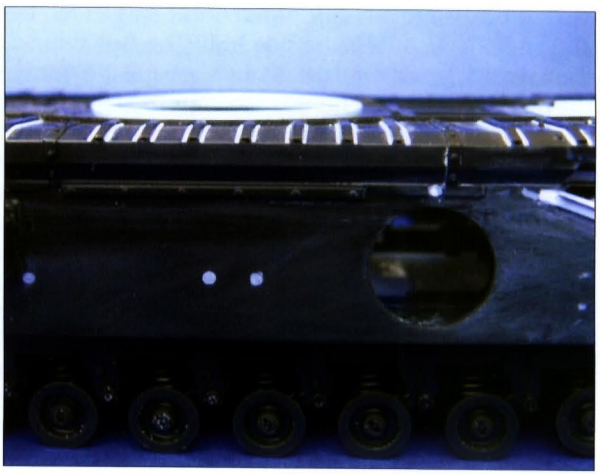
The track supports fixed to the tank.



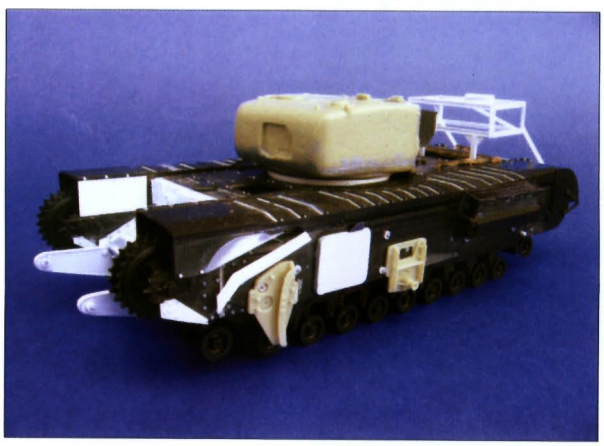
The hull sides were reworked using sheet styrene and putty.

The side escape doors were scratch-built using sheet styrene.

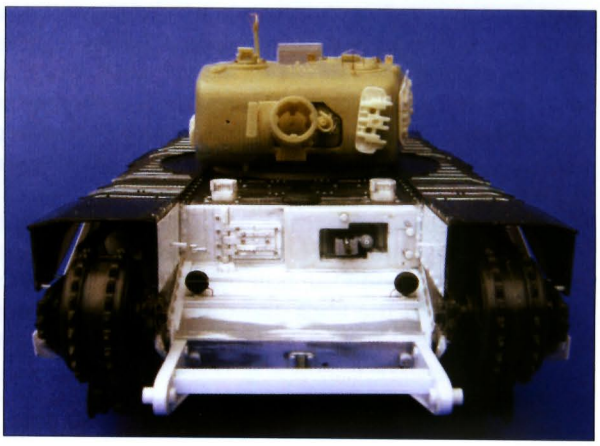
Correct-size rivets were added from the Tichy and Grandt Line series.



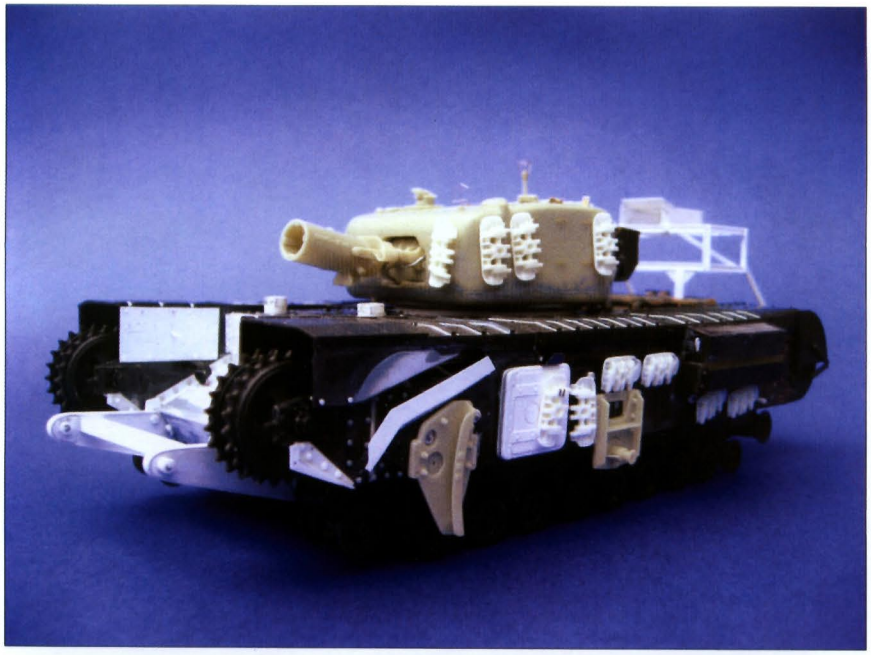
A close-up view of the side hull. Note that the upper track guard ribs have been drilled out.



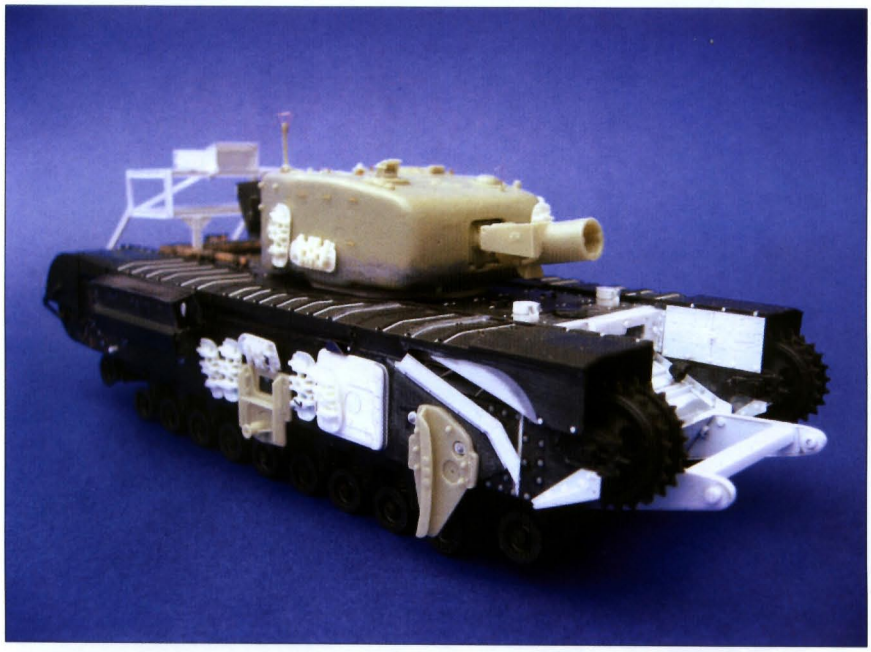
The details added included a rear brace to accommodate the SBG mechanism, and a front lever support for the bridge.



A close-up of the completed front hull area.



Details were added to the turret and some spare tracks were drilled into the side hull and turret.

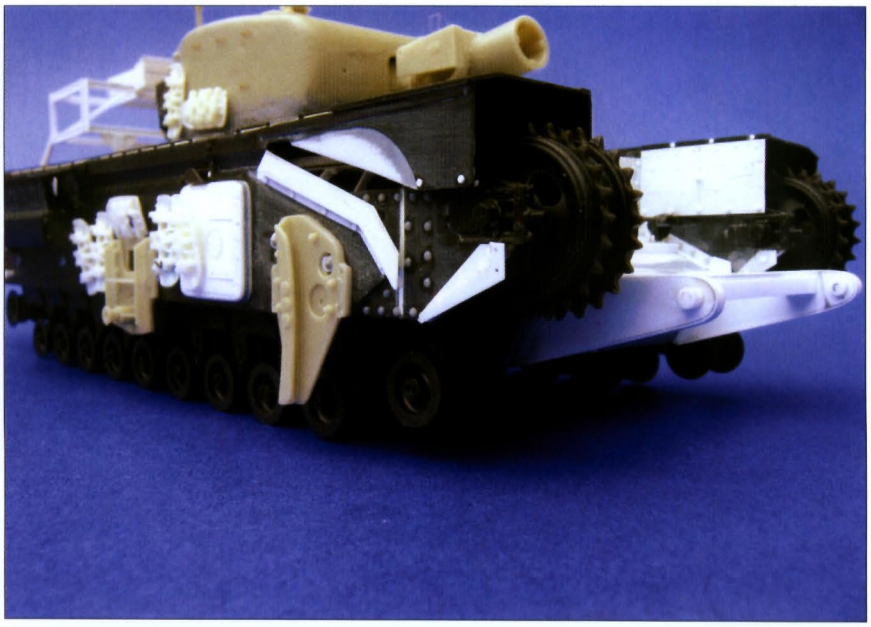


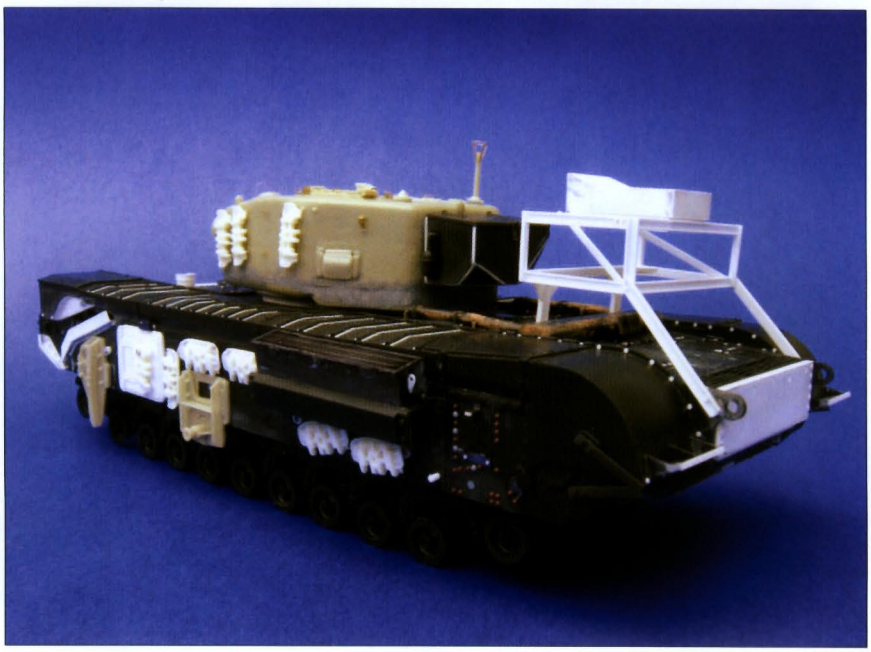
A right-side view of the building process.

Detailing the upper hull involved the standard model improvements such as shaving off the grab handles, filling the various mounting holes, and adding an assortment of Eduard etch-detail sets. The fender ribs were also drilled out and strips of styrene were added along the ribs to replicate the edges of the braces.

Modifications to the rear hull of the model involved a new rear plate made from sheet styrene, counter-sunk rivets, and opening the rear grill by grinding away the excess plastic from below using a Dremel tool. Based on plan-pack drawings, the winch assembly was constructed using an assortment of styrene and made to fit the rear deck. The height of the frame was estimated based on Futter's drawings. Since this would have to support the SBG, the winch structure was reinforced using pins and strips of styrene.

A close up of the mud chute.



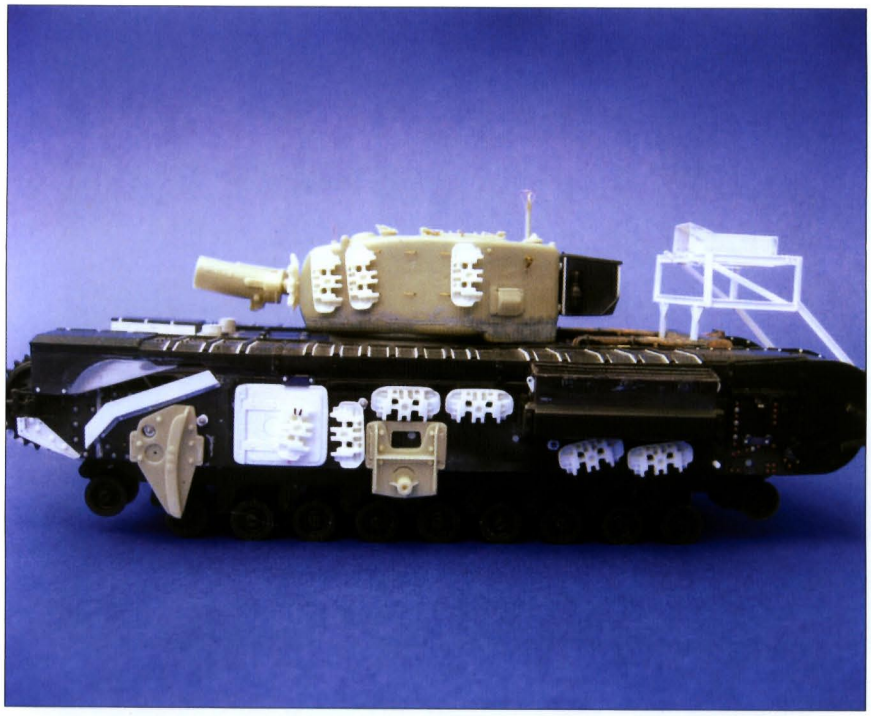


A close-up view of the rear end of the Churchill.

For the turret, the Resicast AVRE conversion resin offering was used. The turret was reworked by sanding the joints and ensuring a flush attachment between the lower and upper turret parts. Eduard etch was also used to render a more accurate rendition of the turret.

The decals for this project were sourced from Archer Fine Transfers and a home computer using the Testors decal making kit. The decal making kit was acquired at a local department store and while the computer software included is very basic, it was capable of producing relatively decent text decals such as the vehicle names and serial numbers.

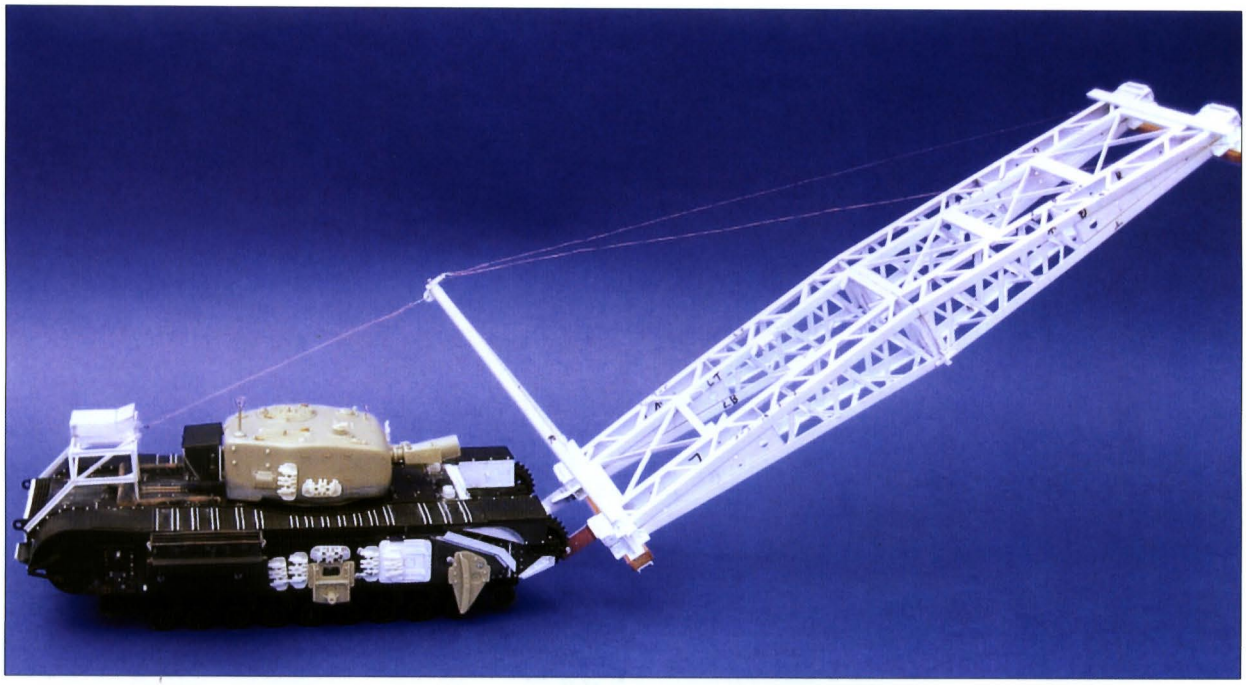
Once the build was complete, the model was primed with Citadel Chaos Black, which provided a very light yet durable surface coat. Once the primer had dried the model was checked for errors before a series of coats of Olive Drab

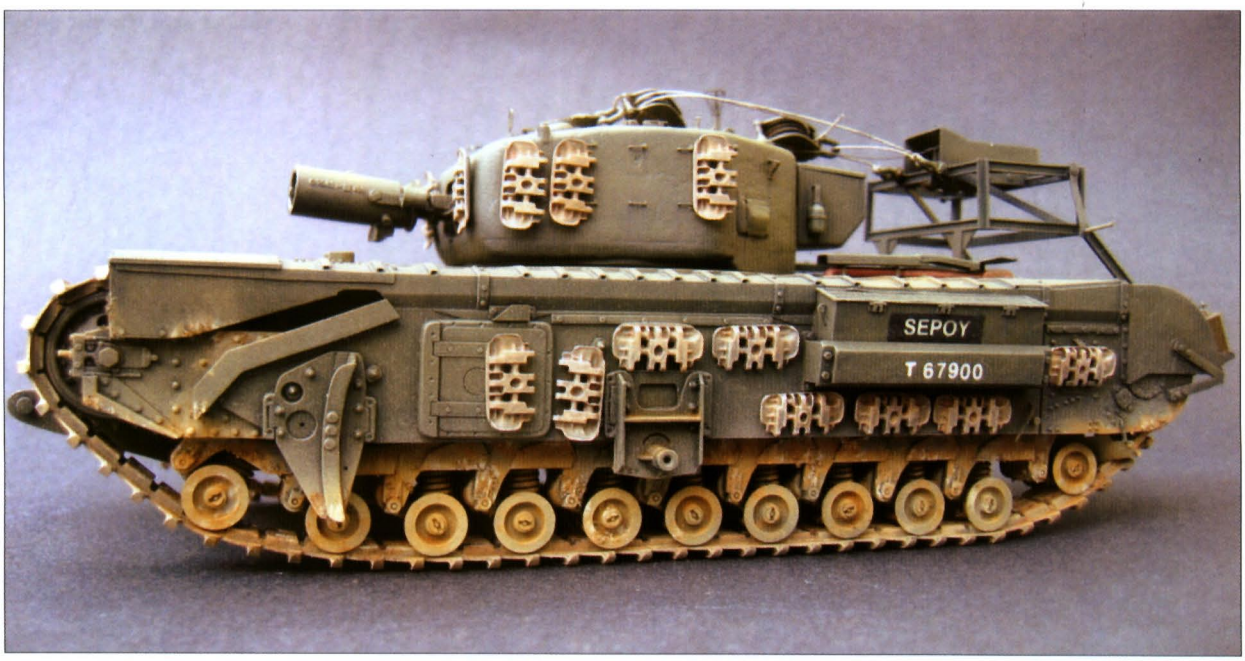


A side view of the completed AVRE project.

was applied, with each coat lightened with Buff in the Tamiya acrylic range of paints. The base coat was allowed to dry for 24 hours before a gloss coat was sprayed on. The decals were added, and a subsequent application of gloss coat was re-applied to seal and protect the decals from subsequent weathering. The model then received a series of light oil washes of Raw Umber and Burnt Sienna, after which a dull coat was applied to seal it all in. To complete the project, some dry-brushing was executed using Humbrol enamel paints, and different shades of earth-coloured pastels were applied.

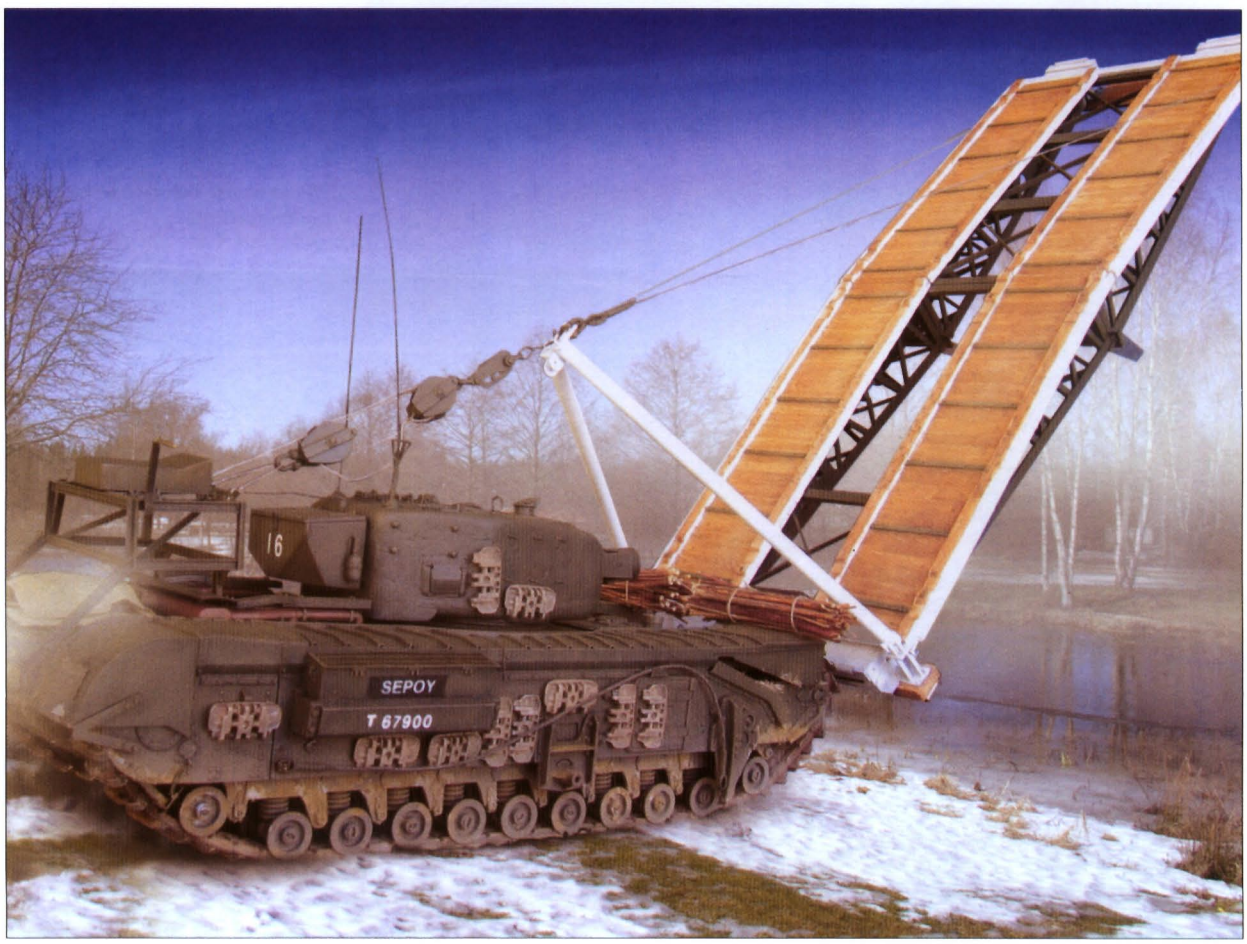
The structure before starting the painting process.





ABOVE The finished AVRE, painted and weathered.

BELOW A montage of the AVRE and SBG. (Ulf Andersson)



Churchill Mk.V (CS), 6th Guards Tank Brigade, Holland 1945

Subject:	'Onze bevrijders zijn hier': *Churchill Mk.V (CS), 6th Guards Tank Brigade, Holland, April 1945*
Modellers:	*Mark Bannerman and Arthur Sekula*
Skill level:	*Advanced/master*
Base kit:	*Tamiya Crocodile*
Scale:	*1/35*
Additional detailing sets used:	*95mm barrel from Cromwell kit* *KK Casting AVRE conversion kit* *Eduard etch detail set* *Accurate Armour tow cables* *Nuts'n'Bits BESA machine guns* *Tamiya paints and MIG pigments*
For the diorama:	*products from Firestorm, Ultracast, Dioart, and Historex.*

Victory at all costs. Victory, however long and hard the road may be, for without victory there is no survival.

Winston Churchill

On September 13, 1944, the American forces entered Maastricht; the liberation of Holland had begun. British troops played a major part in liberating southern Holland, while the First Canadian Army entered north of the Allied line and was to clear the way from the Belgian port of Antwerp. The Allied forces moved through Holland and liberated one village and town after another until hostilities ceased on May 5, 1945.

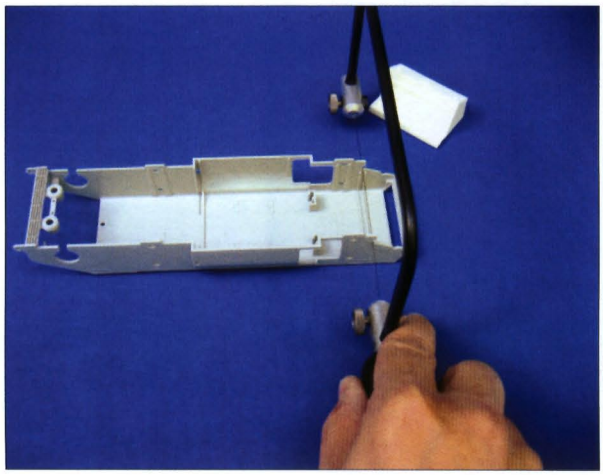
For this project, I wanted to create a diorama of a Churchill V rumbling through a narrow Dutch street in April 1945 and passing a cheering and jubilant crowd of villagers. Photographs of such events in Holland are plentiful and this greatly helped me in mapping out such a scene.

The Churchill V CS (Close Support) played an important role in the Dutch campaign. It first saw combat in the Normandy campaign, and continued in service through to the end of the war. Approximately 240 Churchill Vs were produced and were identical to the Churchill III/IV type except that they mounted a 95mm gun in the turret.

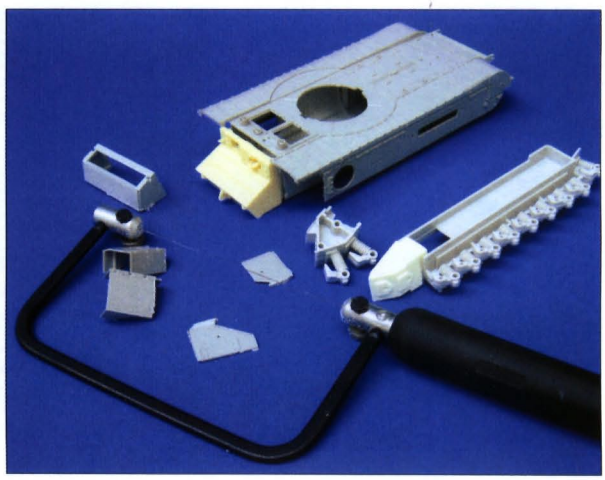
The conversion

For the conversion, I used the Tamiya Churchill Mk.VII, the KK Casting resin AVRE conversion turret (but would not require the actual spigot petard) and most of the etch and resin parts from the Legend AVRE conversion kit. I also used the Eduard photoetch set and the 95mm gun from the Tamiya Centaur kit. Similar to the Dieppe Churchill III project featured previously, this is not a difficult conversion but requires good plans and photographs.

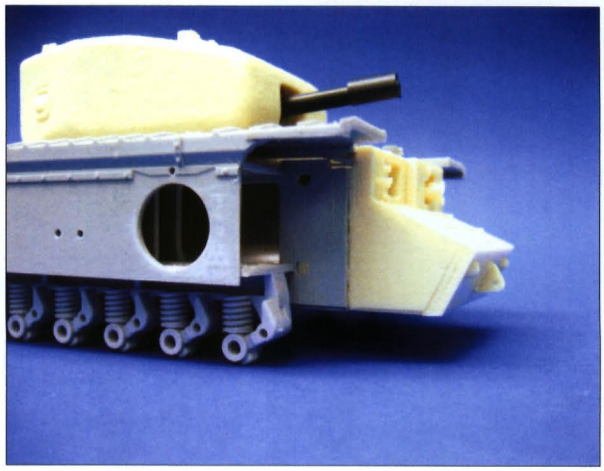
I started the project by reworking the lower hull. Early Churchills had a different-shaped hull nose and the Tamiya front hull was sawn off and replaced with the resin offering included in the KK Casting kit. Early Churchills also had



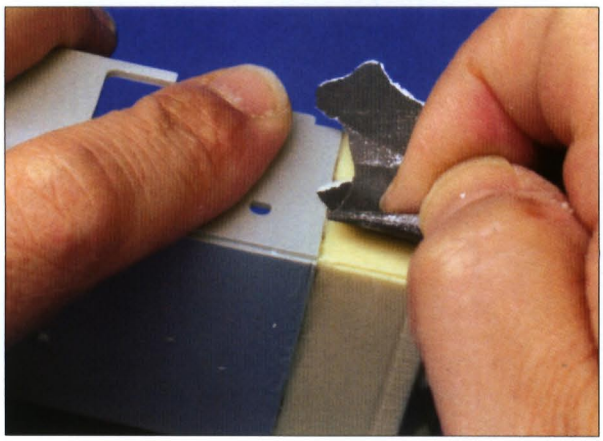
The Tamiya hull nose was removed and replaced with the resin KK Casting offering.



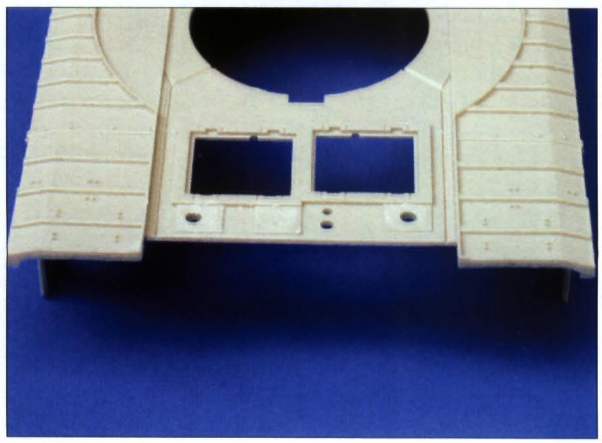
Testing the fit of the upper Tamiya hull with the KK Casting conversion turret.



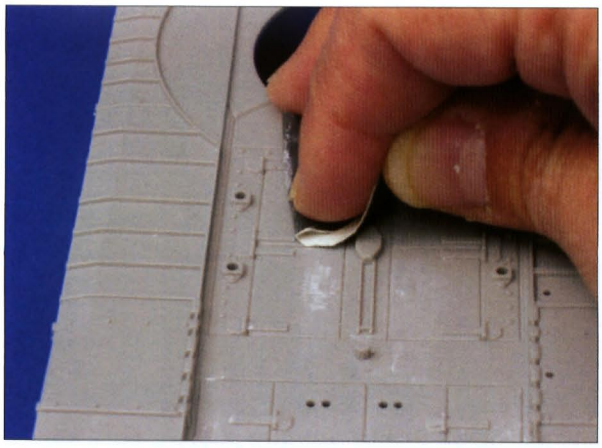
ABOVE AND ABOVE RIGHT **The resin hull nose has been attached with five–minute exopy.**



Sanding off excess glue between the joints with fine sandpaper.



The moulded-on plastic front visors were also modified.



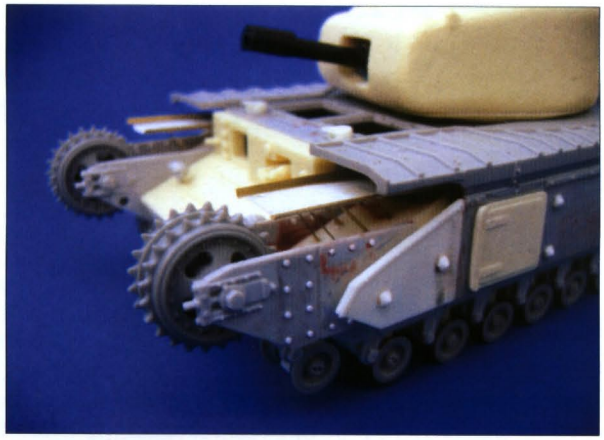
Sanding off the moulded-on latches on the rear deck. Any excessive scratches as a result of too much sanding can be filled with glazing putty.

The wheel attachments have been added, and the 95mm gun from the Tamiya Centaur kit has been inserted. The Legend front hull plates have also been added.

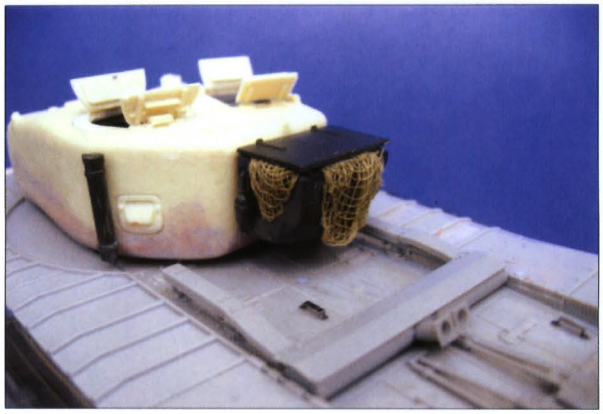
Adding rivets made using a punch and die set.

An in-progress view of the left side of the model.

A right-side view.

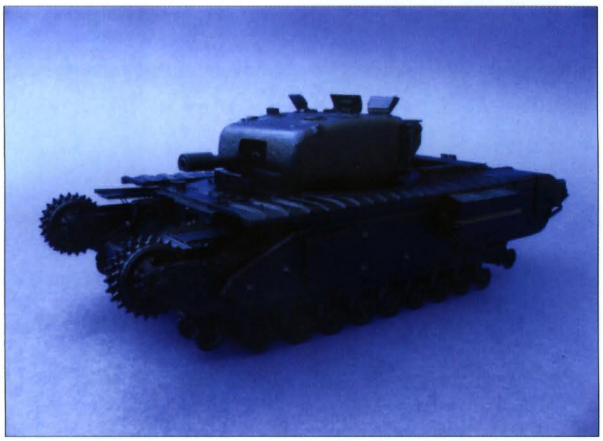


A close-up of the Legend photo-etch track support included in the AVRE conversion kit.



Verlinden netting has been added to the turret bin. The netting was fixed with regular white glue.

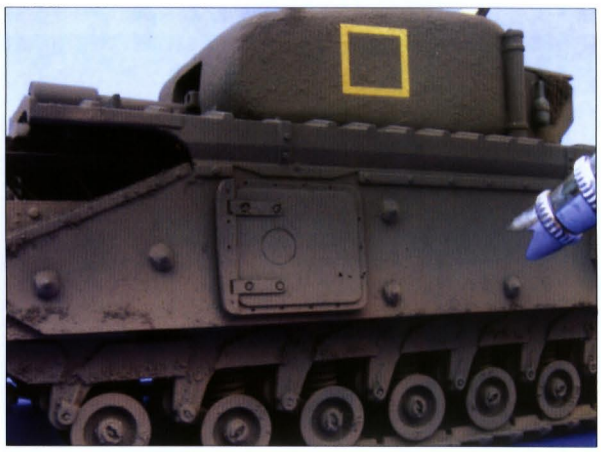
I applied some sage spice to the lower structure to depict mud and also applied MIG pastels for the finer dirt particles.



I started the painting process with a full prime coat in Citadel Black.

I applied two lights coats of Xtra Color Khaki Drab mixed with Testors thinners in a 3:2 ratio. I allowed this to dry for about two days.

The first step in the weathering process was a light spray of heavily thinned Tamiya Deck Tan halfway up the model's sides, front and rear.



I repeated the previous step using heavily thinned Tamiya Flat Earth keeping the mist of paint closer to the lower edges.

two shorter periscopes, and therefore the moulded-on Tamiya plastic ones were cut off at the stem, and replaced with the Legend resin replacement parts. All grab handles were sanded down to accommodate the Eduard PE set.

The major task in the conversion process was reworking the mud channel side panels that run vertically along either side of the tracks. I had considered removing these in their entirety, but opted to simplify the task by sanding down all protruding details, removing the frontal plate and replacing this section of the armour plating with the Legend part. The Legend rectangular resin escape hatches were glued over the circular escape hatch openings on both sides and I also added the Legend conical bolts.

The Tamiya kit turret was discarded and replaced with the KK Casting AVRE turret and the armament was replaced with the Tamiya Centaur 95mm gun. As I planned on having figures in the turret and hull hatches, the KK Casting turret was ideal as it is hollow and includes some interior. I also replaced most of the surface detail with the Eduard photoetch and added a few accessories (Petrol or Water canisters) from Ultracast on the rear fender. I removed the front ribbed guards with a jeweller's saw to replicate several wartime photos of the Mk.V variant in this particular campaign.

Other modifications to the structure included replacing the driver's front visor, adding rivets and front horns on the idler side plates, and adding the Legend resin hull armour bolts. The Legend photoetch air intake and track rails were also added.

Painting the Churchill

The model was gently cleaned with dish detergent and warm water and left to dry. Prior to priming and painting the model, I applied some sage spice to the lower structure to depict mud and also applied MIG pastels for the finer dirt particles. The sage spice was applied by brushing selective amounts of liquid glue onto the lower edges of the model and sprinkling the spice on top. A quick blow to the surface removed any excess spice. This was followed with an application of Tamiya thinners on the hull sides, front and rear and MIG pastels were gently blown onto the thinner wet areas.

The model was now ready for paint. I started with a full prime of the model in Citadel Black. Once dry, I applied two light coats of Xtra Colour Khaki Drab mixed with Testors thinners in a 3:2 ratio. I allowed this to dry for about two days.

At this point, I opted to add the Tamiya vinyl tracks. However, before adding the tracks, these were thoroughly cleaned with soap and water to remove any oily agents. The tracks were primed in Citadel Black and painted in a mix of Tamiya Matt Black and Dark Brown. Once dry, the tracks were glued in place. The advantage of affixing the tracks before the weathering process is that the tracks would receive precisely the same weathering treatment as the model, which results in greater uniformity in both overall tone and colour.

For the markings, I opted for a Mk.V belonging to the 4th Battalion, Armoured Coldstream Guards, 6th Guards Tank Brigade. Archer Fine Transfers were used for this purpose.

For the weathering process, I wanted to depict a well-maintained but weathered Churchill. By April-May 1945, most vehicles had endured a long and harsh winter and rust elements would be evident. The first step in the weathering process was a light spray of heavily thinned Tamiya Deck Tan halfway up the model's sides, front and rear. I allowed this to dry for a few hours and repeated the same step using heavily thinned Tamiya Flat Earth, keeping the mist of paint closer to the lower edges and restricting the paint to the lower quarter of the sides. The result of these two light applications would depict two layers of dried mud. To bring some uniformity to the overall appearance of the model, I also sprayed a very heavily thinned mix (20 per cent paint and 80 per cent thinners) of Tamiya Flat Earth to the whole tank, including the turret and tracks.

A close-up view after a first pin-wash using Sienna oil paint and an enamel-based filter.

The result of pin-washes, filters and a few light dry-brushes over the mud on the lower parts of the model.

The next step was a filter application. The first filter was made up of 95 per cent Testor's thinners mixed with Humbrol Dark Earth and this was applied to the whole tank with a wide brush. It should be noted that filters should be tinted thinners and not thinned paint. I repeated the step by applying another filter of Winsor & Newton Raw Sienna to the whole model tank. Once dry, this was followed with several applications of local pin washes using Raw Umber, ensuring to cover bolts, rivets and along seam lines.

Once the filters and pin washes had thoroughly dried, I applied two light dry-brushes of Humbrol 84 to the entire model and also executed some careful dry-brushing of Humbrol 84 mixed 50/50 with Matt White onto the chunks of mud on the lower parts of the model.

I then added a few paint chips and scratches with Vallejo Black mixed with Dark Grey and selective applications of rust streaks using MIG pigment 'Rust' mixed with 'Black' heavily diluted in Tamiya thinners. I also added minute steel chips with a 2B pencil on selected parts of the high-wear edges of the tank.

Other painting details included dry-brushing the camo netting in the turret bin with various shades of Humbrol enamel browns, adding oil stains on the PoW cans with Raw Umber, and affixing some equipment and accessories on the rear engine deck and sides of the turret. The wooden handles on the shovels and pickaxe on the rear deck were painted Humbrol Dark Yellow 93 and washed in Burnt Sienna. The leather padding on the inside of the turret hatches was base-painted Vallejo Cream and stained with Winsor & Newton Raw Umber. The tracks received a dry-brushing of XtraColour Gun Metal followed by XtraColour Oily Steel. The spare tracks on the hull side and rear

The completed Churchill.

were painted Tamiya Buff and washed with Sepia oil paints. The inside of the open driver's vision port was painted in a mix of Vallejo Silver and Dark Grey and washed in Rembrandt Payne's Grey.

Adding the figures

I now turned my attention to the figures. The tank crew is an assortment of Firestorm, Ultracast, Hornet and Alpha Image offerings – all modified with Hornet heads. The civilians are from the Preiser line (plastic) and Belgo Models (metal). All ten figures on the diorama were painted using the same methodology of oils and enamels.

To start, each figure was primed with two light coats of Citadel Skull White. I then added a flesh stain on each figure's face and hands with a mix of Gold Ochre, Burnt Sienna and Titanium White in a 2:1:4 ratio. The paint was jabbed on by poking the brush lightly – not stroked. These were left to dry for a week.

The next step was spraying two light applications of Gloss Cote on the figures' face and hands to seal up the stained base colour. I then applied a minute wash of Raw Umber on all of the heads and hands. Once this had dried, I re-applied another round of 'stains' using same oil colours of Gold Ochre, Burnt Sienna and Titanium White but this time in a ratio of about 1:1:6. Again, the base paint was jabbed with small pokes and always avoiding directly jabbing into the shadows areas. I also used a wide brush to remove excess paint by stroking the brush lightly downwards to smooth out the paint.

Each head then received 'rosy' cheeks by adding a small amount of Humbrol Brick Red 70 mixed in the base colour. The eyes were applied with an off-white colour into the corners of the sockets using toothpick splinters with irises being added using Raw Umber oil paints (black paint for irises is too stark).

The final steps included adding eyebrows and teeth (if required) and a stain on the lower lip in Humbrol Matt Wine mixed with the flesh tone. Some 'five o'clock shadow' was added using Payne's Grey oils in a subtle staining – that is, jabbing the brush into the area with minimal paint and drawing out the paint as thinly as possible.

All uniforms and clothing were painted in Humbrol enamels using the 'Stop Sign Theory' i.e. for every highlight applied, a shadow is added to compensate. Clothing typically receives a base colour and a subsequent treatment of two highlights and two or three shadows using Humbrol 'Flesh' mixed in the base colour for the highlighting medium and various shades of Humbrol Browns for the shadows.

The diorama: '*Onze bevrijders zijn hier*'

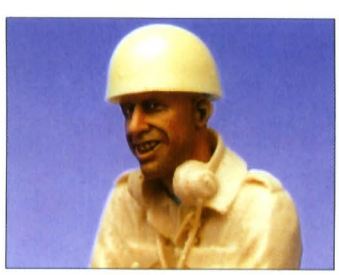
Arthur Sekula, who is renowned for his award-winning dioramas, kindly agreed to build the stage on which to depict a moment in time during the liberation of Holland. He started on the project by planning the basic shape with various sketches to help visualize the idea and concept of what he wanted to achieve.

Arthur started the work by gathering and accumulating photos, primarily from the web, of typical Dutch village buildings and streets. Once the information was gathered, an 'average' architectural profile of a street in Holland was created. He started working on masters for certain pieces that would be required in larger numbers during the construction of the diorama. Arthur created masters for the windows and doors using sheet styrene of various shape and thickness. Once he had created the masters, a rubber (RTV) mould was fabricated to allow for multiples of window frames, sidewalk sections and doors. A similar process was used to create the roof sections. These were then cast in resin. After the resin had set, the parts were cleaned of any flash and pouring blocks.

Arthur then started on the main frame of the diorama by cutting sheets of gatorboard. These were affixed using carpenter's white glue. Gatorboard is preferable because it is light in weight and durable. Once the two-tiered structural base of the diorama was complete, he added a ceramic canal embankment

A Hornet dispatcher with Hornet head. The flesh parts were painted in oils, and leather jerkin and clothing with Humbrol paints.

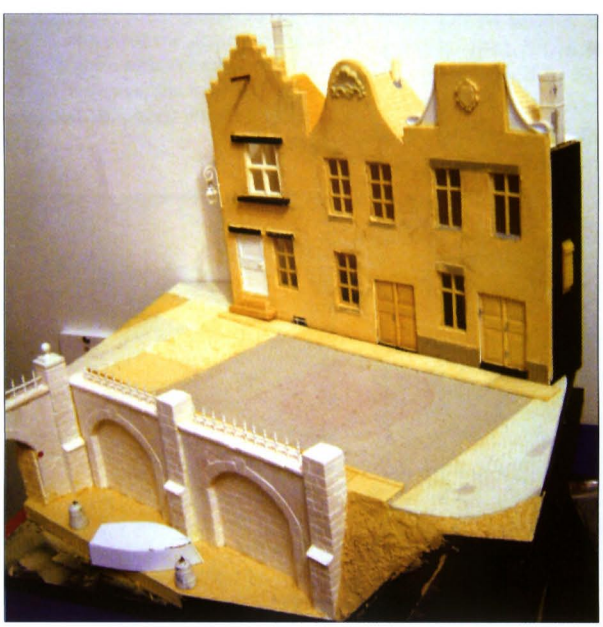
A Hornet figure. The Khaki colour for the clothing was a combination of various dark green and brown Humbrol paints. Shadows and highlights were created using oil paints. The eyes and eyebrow were 'painted' in using toothpick splinters and oil paints.



The tank co-driver. The gaps between the teeth were created by using a toothpick splinter and dark brown oil paint. The five o'clock shadow was applied using a very thin application of Payne's Grey oils, which was blended into the flesh colour.

The base was made using thin boards purchased at the local hardware store. The canal wall is a resin offering from Firestorm and the spiked railing is from the Historex series.

The buildings were cut from thick cardboard using photo references as a guide.



The diorama begins to take shape.

from the Firestorm range of diorama products. He also added shortened Historex spiked fence to the top of the embankment. Arthur then applied Firestorm cobblestone street sections and the resin cobblestone was attached using superglue. Joints between the cobblestone sections were filled with Tamiya putty.

After completing the base and street level, Arthur started on the building facades. Using sketches and photographs, he drew the layout on a sheet of 1/16in. foamcore. With an X-acto knife and metal ruler, he cut out the door and window openings and added the resin-cast window frames and doors. Several dry runs were necessary to ensure the building facades were a good fit to the base.

Arthur built a small fishing boat hull for the embankment's edge. The boat hull was built out of sheet styrene. Other diorama details such as the stairs, parapets and the building roof sections and chimneys were also added. The building facades were covered with woodfiller by LePage. This product simulates stucco finish on buildings and concrete and also realistically replicates soil. It is highly recommended, as it does not crack once it has dried and remains semi-flexible.

After a week of drying, Arthur sanded all rough surfaces and touched up any imperfections with Tamiya putty. The entire diorama was then primed with Chaos Black primer from the Games Workshop range of aerosol spray paints. Using a mixture of Vallejo acrylic paints, Tamiya paints and Delta acrylics, he proceeded to airbrush the individual components of the diorama. He prefers applying the pre-shading technique on all larger areas in order to give the overall appearance more tonal depth. He also painted the cobblestone street ensuring to create different shades of grey for the colour of the sidewalks and the embankment.

Arthur applied several pin-washes and also picked out smaller details with a regular '00' brush. Some of the items such as the rotting boat were painted separately from the diorama and glued in place after the diorama had been completely painted and weathered. Building facades were airbrushed in several different colour tones with a final coat of acrylic dust. Several further washes and dry-brushing treatments helped accentuate and enhance the details.

The next step was the brush painting and highlighting of smaller details. Most of the abandoned German gear by the embankment is from the spares box, chiefly from DML and Ultracast as well as printed accessories such as the *zeltbahn*, German documents, cigarette packs, street signage and numbers from Dioart. A small scratch-built pigeon was added to the top of one of the buildings and a broom made from a matchstick with model grass was propped in a doorway.

The final step in the diorama process was an overall dusting using ground chalk pastels. I also added an Italeri Quad Tractor, which I built essentially out-of-the-box with a few accessories added to the rear roof.

Airbrushing the diorama using acrylic paint. The paint was applied in several layers with each application lighter in tone than the previous, to create highlights.

The result of several light coats of paint applied to the canal wall.

The façade of the buildings. Note the attention to detail, including potted flowers on the window ledges, a broom in the doorway, street signs and house numbers.

A close up of the broom, fashioned from a matchstick and railroad modelling grass.

The canal waterfront is strewn with German equipment to convey the urgency in which the German troops have left the town.

The diorama is complete and ready to accommodate armour and figures.

ABOVE AND OPPOSITE PAGE The enjoyable part of any diorama is 'setting the scene'. In this scene, villagers are waving flags at the Allied troops, while a dispatcher is directing the on-coming traffic.

A close up of the dispatcher directing traffic.

A close up of the tankers.

RIGHT The Italeri Quad Tractor was built essentially out of the box, with a few minor modifications.

BELOW A front view of the Churchill Mk.V.

Churchill gallery

Churchill AVRE, 79th Armoured Division, Normandy 1944

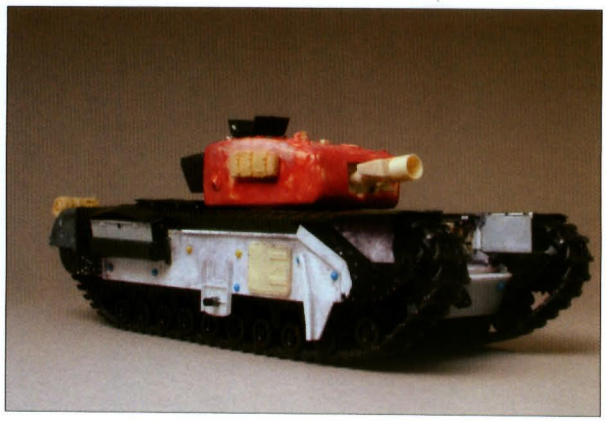
Subject:	*Churchill AVRE, 79th Armoured Division, Normandy 1944*
Modeller/photos:	*Werner Kamphelve/Wolfram Bradac*
Base kit:	*Tamiya Churchill VII*
Scale:	*1/35*
Additional detailing sets used:	*AL-BY Conversion kit*
Paints:	*Tamiya and Gunze MIG weathering pigments*

Werner converted the Tamiya Churchill to an AVRE with the AL-BY conversion kit, which includes a hollow turret, the 290mm mortar, rectangular hatches for the side sponsons and the frontal armour.

Werner removed the three periscopes (driver and co-driver) on the Tamiya kit, shortened two of these in height and relocated these. For the side sponsons, these were reworked to backdate the tank to a Mk.IV by removing about two-thirds of the outer sponsons and rebuilding these with Evergreen sheet styrene. The smaller bolts were produced with a Grainers Set and 0.4mm plastic, while

The Churchill ARVE in a photo-montage, with the French countryside in the background. (Ulf Anderson)

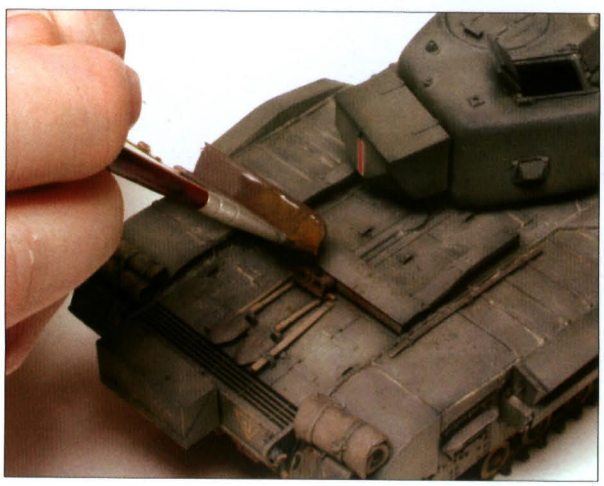
The Tamiya kit with AL-BY conversion set and sheet styrene for the side hull mud channels. Note the placement of the bolts.



Vinyl tracks supplied in the Tamiya kit were used for the project.

Note the use of resin after-market accessories on the rear fenders.

Dirt and mud was made from a mixture of earth, sand, static grass and Revell airbrush paints.



Werner used MIG pastels, mixing sand yellow and earth-coloured powders. A piece of kitchen cloth moistened with water was used to remove excess pigment.

The completed model.

the larger nuts were sliced from a baby's rattle. Most AVREs had brackets affixed to the sides of the sponsons for special task attachments. These were built out of sheet styrene using wartime photos as a reference.

Construction of the AL-BY turret was relatively simple, but the fit between upper and lower part was poor. Car filler and copious amounts of putty helped to align the two parts. The serial numbers on the spigot mortar were cut from plastic kit sprues with an X-Acto knife and applied onto the mortar with liquid glue.

The turret was covered with a thin layer of Squadron Red Putty and a thin application of liquid glue was applied over the putty. After 24 hours of drying time, the turret was sanded with fine sandpaper to enhance the armour texturing. To represent the texture on the rest of the vehicle, Werner used liquid glue to soften the plastic and a stiff brush was poked lightly onto the surface to add texture. He also added rivets to the upper part of the sponsons using Grainers Set and 0.2mm plastic card.

For the painting process, Werner airbrushed a base coat of Tamiya Flat Black with three subsequent shades of olive green mixed from the Tamiya and Gunze acrylic colour range. He airbrushed the base paint by avoiding the edges and recesses to reveal the darker primer areas.

The markings were primarily dry transfers and the name of the tank 'CYCLOP' was fashioned using dry transfers from Letraset. After spraying a layer of Gunze Matt 20, Werner airbrushed a heavily thinned Black and Burnt Sienna oils mixed with white spirit in a 1:9 ratio. He also applied a conservative wash with a brush using the same oil colours and thinning ratio.

For the weathering, Werner used MIG pigments by mixing sand yellow and earth-coloured powder. He applied the pigments dry and used a piece of kitchen cloth moistened with water to remove excess amounts. The dirt and mud was made from a mixture of earth, sand, static grass and Revell airbrush paints (Earth and Grey), which was then added with an old brush onto the lower structure of the kit and into the tracks. Scratches and chipped-off paint were simulated with a pencil and enamel Humbrol 53 paint.

To finish the kit, Werner mixed thinned brown oils with Humbrol satin and applied the mix with a fine brush onto the chosen areas to depict oil stains. It is critical to restrain the application as the effect can appear overdone. The last step was selectively adding MIG pastels (dry), completing the overall weathered appearance of the tank.

Montage of the Churchill ARVE in a field. (Daniel Munoz)

Churchill NA 75, 21st Army Tank Brigade, Italy 1944

Subject:	*Churchill NA 75, 21st Army Tank Brigade, Italy 1944*
Modellers:	*Mark Bannerman and Pat Johnson*
Base kit:	*Tamiya Churchill VII*
Scale:	*1/35*
Additional detailing sets used:	*KK Casting conversion kit* *Jordi Rubio 75mm barrel* *Eduard photoetch detail set* *Accurate Armour tow cables* *Tamiya paints* *MIG weathering pigments*

At the end of the North African campaign, the British experimented with fitting the M3 75mm gun and mantlet from scrapped Shermans onto Churchills. About 200 Churchills were up-gunned with the American 75mm and most of the newly designated Churchill NA (i.e. 'North Africa') 75s were assigned to the 21st and 25th Army Tank Brigades serving in the Italian campaign.

The KK Casting conversion was used for this project with the Tamiya Churchill VII kit, replacement Jordi Rubio aluminium barrel, and Eduard photo-etch set. The conversion required some alterations including the replacement of the front hull with the resin KK Casting offering and reworking the upper track guards and side sponsons.

Photographs of the Churchill NA 75 serving in Italy typically show the middle section of the track guard fenders removed. I removed the middle section of the upper guard using a small hacksaw and cleaned up the edges with an emery board. It was also common for the Churchill NA 75 to have appliqué welded directly onto the sides of the sponsons for added protection. I fashioned these from .20 sheet styrene using diagrams and templates from the old but very useful Tamiya soft -bound photographic book on the Churchill. Before applying the sheet styrene appliqué, I sanded off all protruding details on the Tamiya kit track guard sides. I also perforated the sheet styrene appliqué with a small hole punch to accommodate the conical bolts. The side resin hatches included in the conversion kit were glued in place and a T-shaped appliqué plate from sheet styrene was glued onto the hatch. The conical bolts used for this project were the extras included with the Castoff Churchill Mk.III conversion kit.

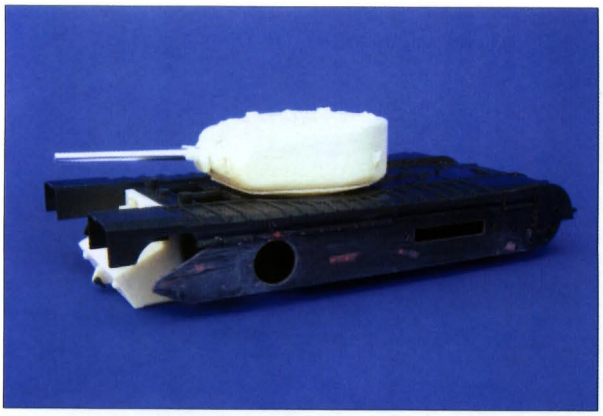
Other modifications included replacing the upper hull grab handles with Eduard photoetch, replacing the visors on the front hull, and adding a few missing rivets with a punch and die set.

For the turret, the KK Casting conversion turret is quite accurate and also comes with an interior complete with radio, seat, and general equipment. The only modification to the turret was sanding down the resin barrel and replacing this with a Jordi Rubio metal offering. Car filler and Tamiya putty were used to fill the gap between the upper and lower joints of the turret.

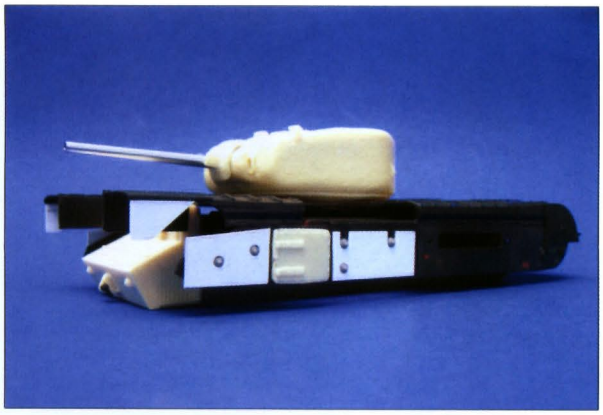
The remainder of the kit was built as per the Tamiya instructions including the addition of the front track guard flaps and the vinyl tracks. I also added some equipment including PoW canisters from Ultracast and antennae made from guitar strings.

The paint process was straightforward with a primer of Citadel Chaos Black and a base application of Gunze Olive Drab. I then applied homemade decals to represent the North Irish Horse.

Wartime photographs of the NA 75s serving in Italy almost always show them finished in a sand-coloured paint scheme. In fact, this lightened colour



The KK Casting nose was attached and side hull details were sanded off.



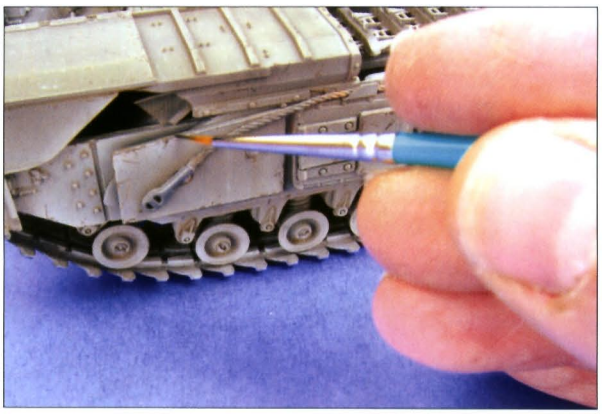
Appliqué from sheet styrene and Castoff bolts were inserted in the holes.

The model was primed in two light coats with Citadel Chaos Black primer out of an aerosol can.

The model was base-coated in railroad PollyScale Empire Green, in two light coats.

The lower structure of the model was misted with a heavily thinned mix of thinner and Tamiya Medium Grey, followed by an equally thinned spray of Tamiya Deck Tan.

A filter was applied using Raw Umber paints thinned with Testors thinners.



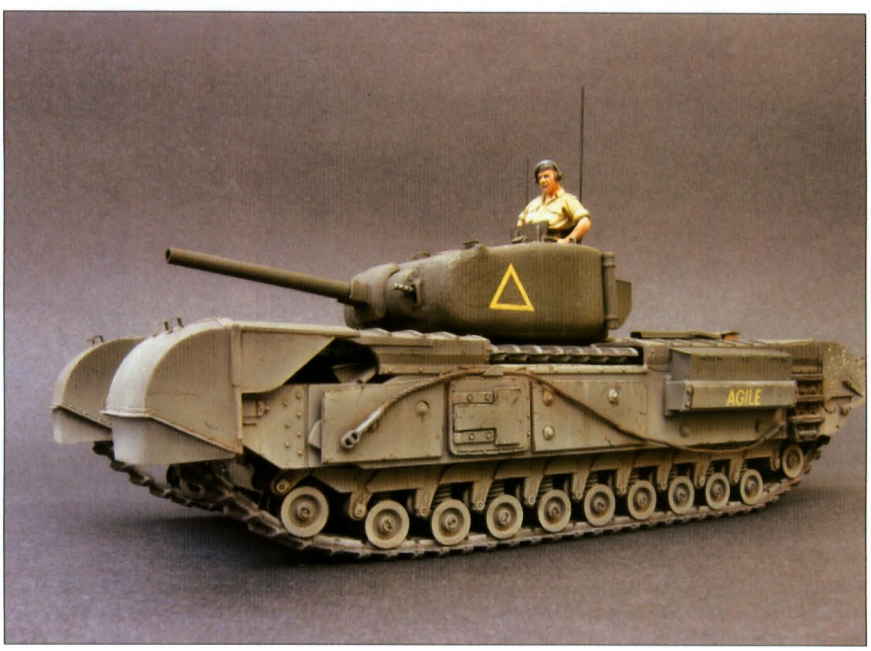
Scratches were added using a pointed brush and a mix of Humbrol Matt Black and Raw Umber oils.

Pastels were added to further weather the tank.

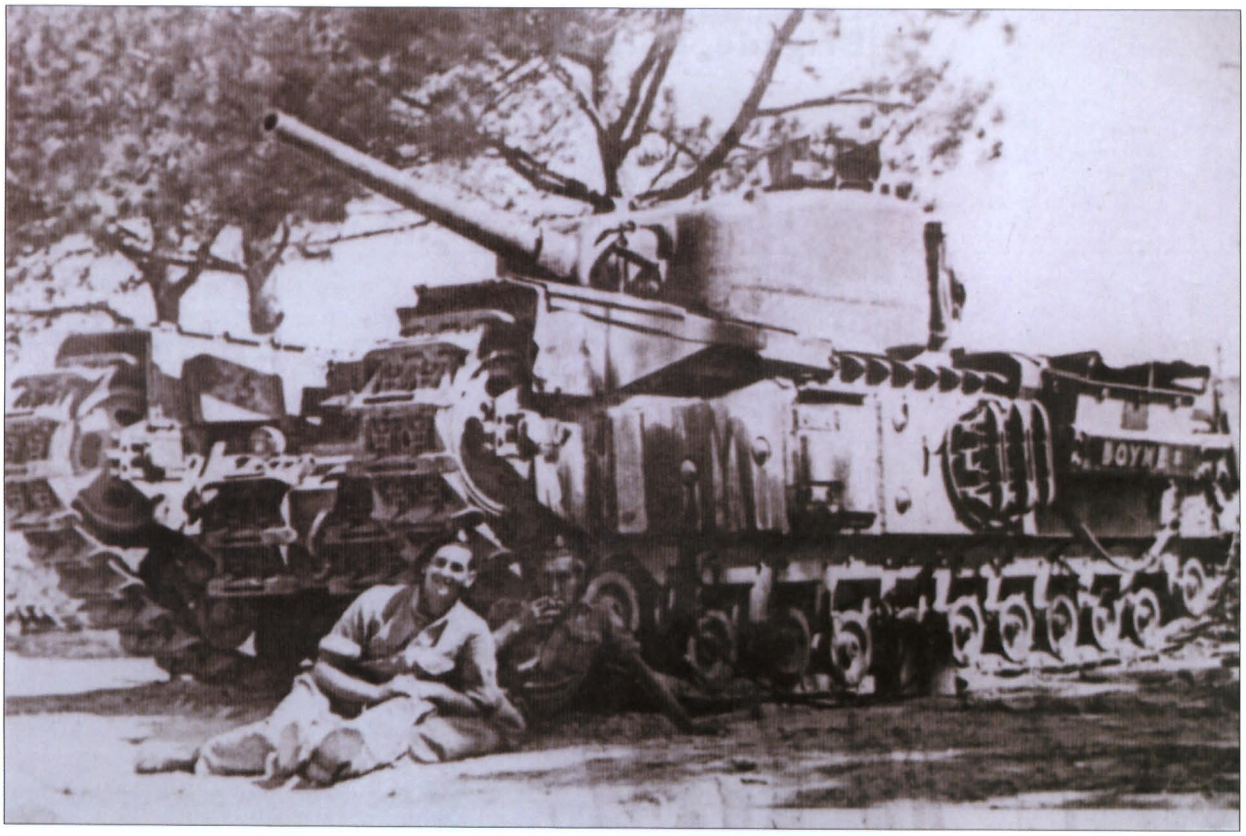
represents several layers of dust and grime as a result of the dusty Italian terrain. To replicate this heavy weathered appearance, I asked Pat Johnson to assist in sharing his unique weathering technique on this particular vehicle.

Pat started the weathering process by lightly spraying the lower part of the kit with a light misting of Tamiya Medium Grey, and once dry, he repeated the same step using Tamiya Deck Tan. Once this had dried, he applied two light filters of Winsor & Newton Raw Umber onto the whole tank. He then dampened the surface of the tank with Testors thinners and applied a series of pin washes of Raw Umber ensuring to catch bolts, rivets and along seam lines. He allowed this to dry thoroughly and applied two light dry-brushings of Humbrol 84 with a small amount of a Winsor & Newton Yellow Ochre and Titanium white mix.

Fuel stains were added using Raw Umber mixed with thinners. Chips and scratches were applied using a fine brush and a thin mix of Raw Umber and Humbrol Matt Black. Some subtle black and dark brown pastels were added to complete the weathering process.



A photo of the completed tank from the left side. A Hornet figure has been added to the model, to add depth and weight.



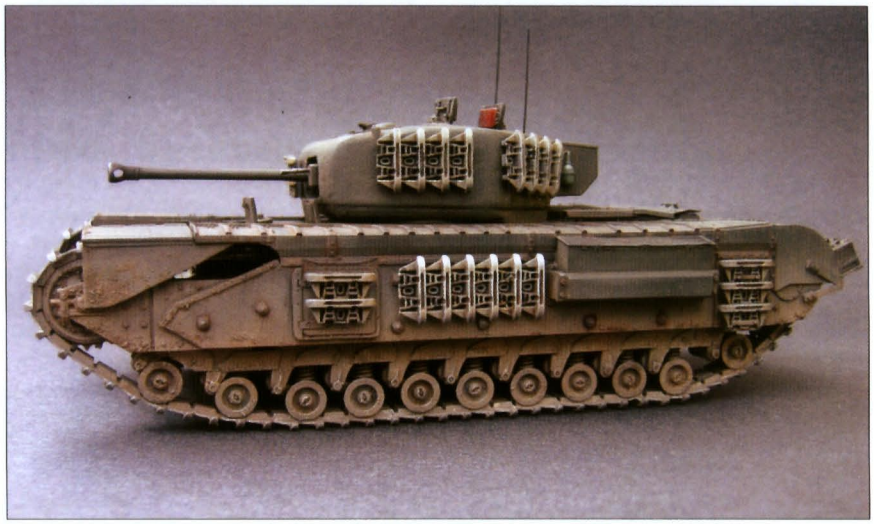
ABOVE A wartime photo of the NA 75. (Derek Cox)

BELOW A composite image of the finished model by Daniel Munoz.

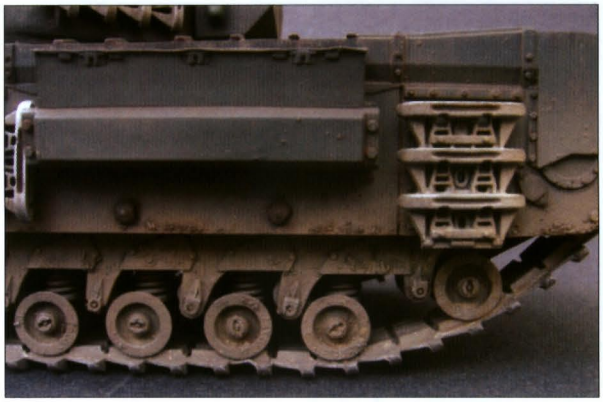
Churchill Mk.VI 75mm QF, 6th Guards Tank Brigade, Belgium 1944

Subject:	*Churchill Mk.VI 75mm Quick Firing, 6th Guards Tank Brigade, Belgium 1944*
Modeller:	*Mark Bannerman*
Base kit:	*Tamiya Crocodile*
Scale:	*1/35*
Accessories:	*Resicast AVRE with Tamiya 75mm QF* *Eduard photoetch detail set* *Accurate Armour tow cables* *Xtra Colour paints* *MIG weathering pigments* *Archer Fine Transfers*

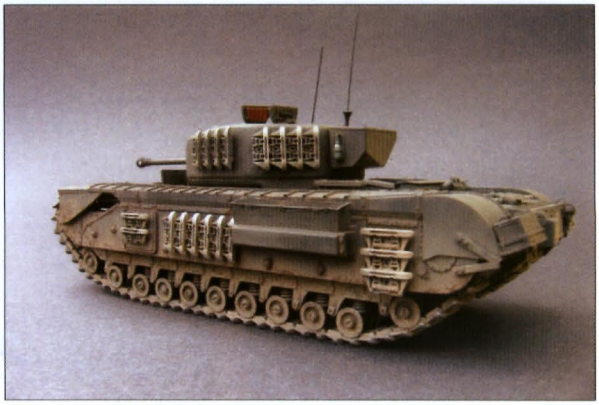
Many photographs of Churchill Vs and VIs depict turrets and front hulls laden with tracks that were welded on for added protection against enemy fire. For this project, I used the Tamiya kit vinyl offerings and glued these down on the kit, following photo references as my guide.



The completed kit from the left side. Vinyl tracks were used for the added armour. Guitar string was used for the antennae. Note the subtle pastel weathering.



A detailed view of the weathering applied to the Mk.VI.



A rear view of the completed model.

Churchill III, Kingforce Unit, El Alamein, 1942

Subject:	*Churchill III, Kingforce Unit, El Alamein, 1942*
Modeller:	*Jorge Lopez*
Base kit:	*Tamiya Churchill Mk.VII*
Scale:	*1/35*
Accessories:	*KK Casting hull nose* *Evergreen card (turret and hull details)* *Humbrol enamel and Vallejo acrylic paints* *MIG weathering pigments*

This Churchill III conversion represents a vehicle of the Kingforce unit, which fought in El Alamein in 1942. The unit received a small number of Churchills for evaluation purposes in the desert campaign, and following positive results, the British Army started to use the Churchill in great numbers in Tunisia.

A composite illustration showing the Churchill Mk.III in action in Tunisia. (Ulf Anderson)

Note the careful placement of scratches and chips using Vallejo paints.

A rear view of the Mk.III. The additional fuel tank has been fixed. Photo-etch PoW (petrol or water) cannisters have been added on the rear fender.

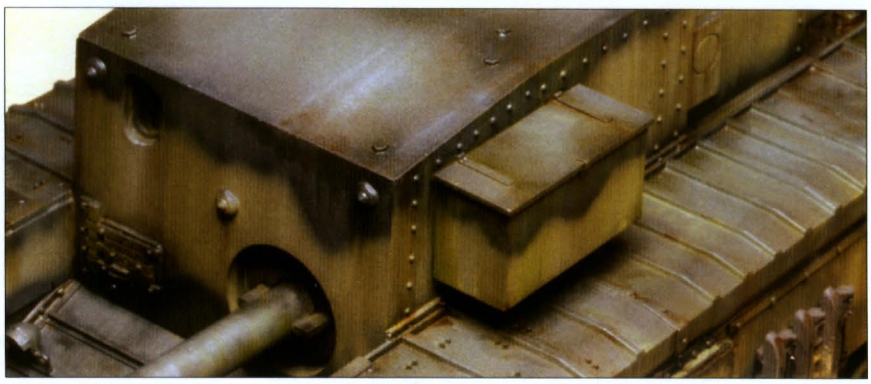
Churchill 3in. Gun Carrier

Subject:	*Churchill 3in. Gun Carrier*
Modeller:	*Mike Rinaldi*
Base kit:	*Tamiya Churchill Mk.VII*
Scale:	*1/35*
Accessories:	*IMA 3in. Gun Carrier conversion* *Friulmodel ATL-60 Churchill tracks* *Hudson & Allen tow chain* *Verlinden 90mm brass rounds* *Lifecolour and Tamiya paints* *MIG Pigments*

The 3in. Gun Carrier was built in late 1942 to help give the Allies a heavy-gun armoured weapons system. A delay in deciding to introduce this variant was eventually overcome as the 17-pdr. AT gun was made available instead.

The first layer of brown camouflage was applied and then post-shaded before the black was sprayed on. Tamiya's NATO Black is an excellent starting point and is lightened with Khaki in successive coats. Once the paint is thoroughly dry, a thin layer of Europe Dust was brushed all over the lower half of the model followed by filters and spot washes using artist's oil. All upper surfaces were treated with filters using a stipple method to blend these in. MIG pigments were applied over the filters and then worked into the various corners and surface details of the model. Darker earth tones were applied on the substructure. Satin Varnish was sprayed on to highlight details, followed by a little graphite powder to create a metallic sheen.

Reference images show a unique two-tone black over a brown camouflage scheme.

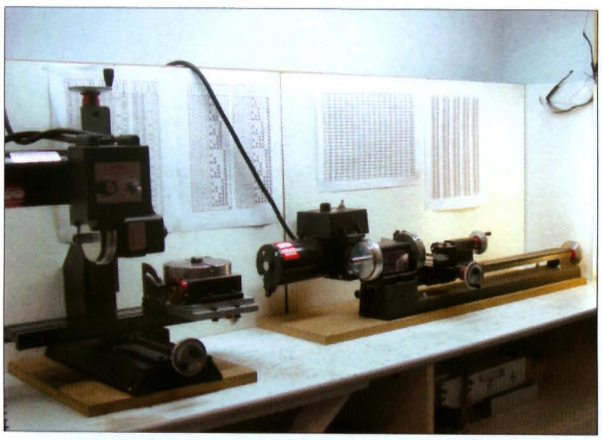


The resin conversion from IMA and the Tamiya plastic kit were used for this project. No records exist to indicate whether any of the fifty 3in. Churchills built actually served at the front. However, some chassis were known to have been converted into other specialized roles.

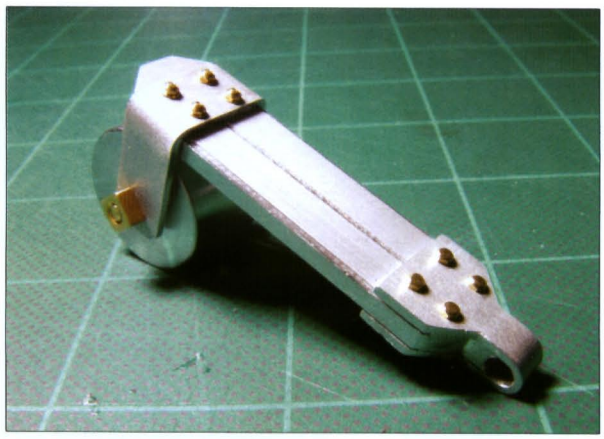
Churchill CIRD (18in.)

Subject:	*Churchill Canadian Indestructible Roller Device (18in.)*
Modellers:	*CIRD: Daniel Munoz* *AVRE Mk.III: Paul Bacon*
Scale:	*1/35*
Photos:	*Daniel Munoz/Mark Bannerman*

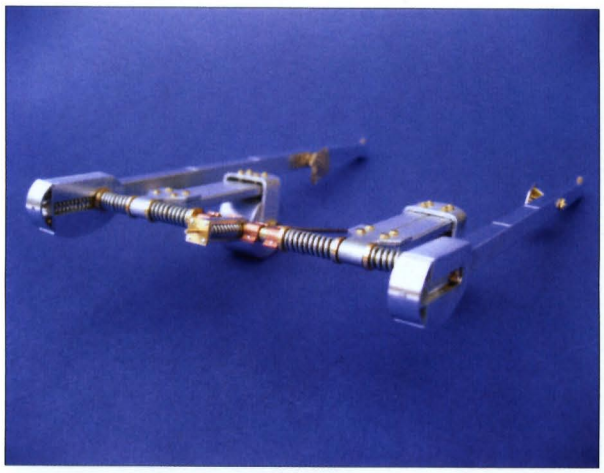
Several types of anti-mine attachments were developed for the Churchill tank, mostly in the form of rollers. One of these mine rollers was designed in 1943 by the Canadian Army. It was named the Canadian Indestructible Roller Device (CIRD) and consisted of two arms attached to the sides of the tank, each supporting a heavy roller. The roller device was attached and positioned in front of the tank's tracks. When the roller detonated a mine, the blast from the explosion would force the roller to rotate in an arc thereby reducing the chance of the rollers being blown off the arms. The CIRD was not developed in time to be produced in large quantities before the end of the war.

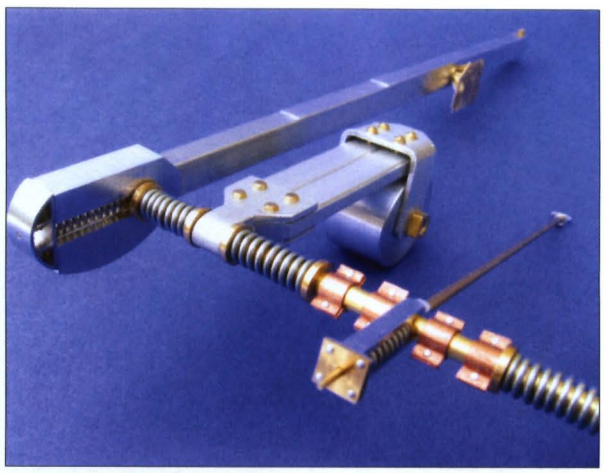


Daniel's Sherline machinery, used to build the CIRD.



One of the CIRD rollers completed.

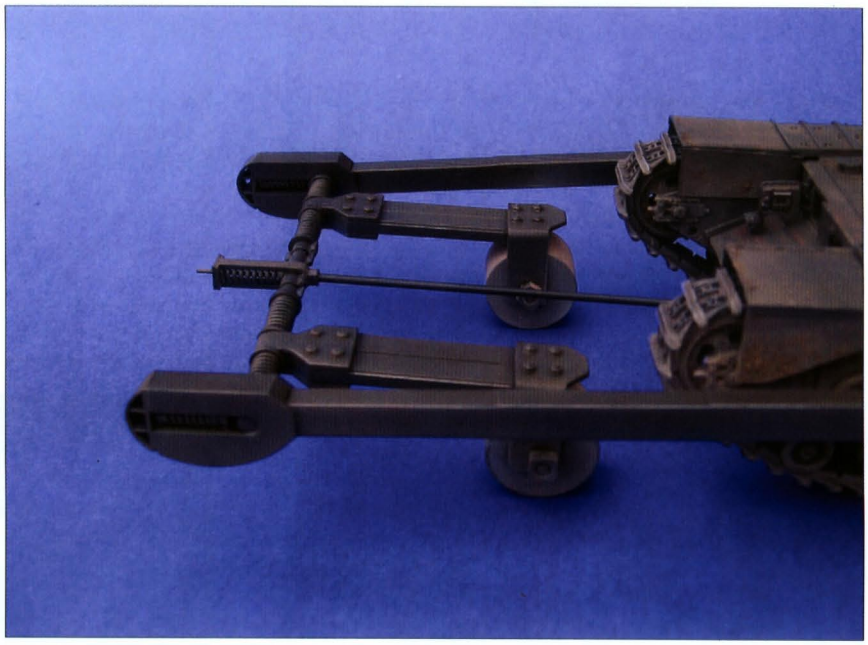




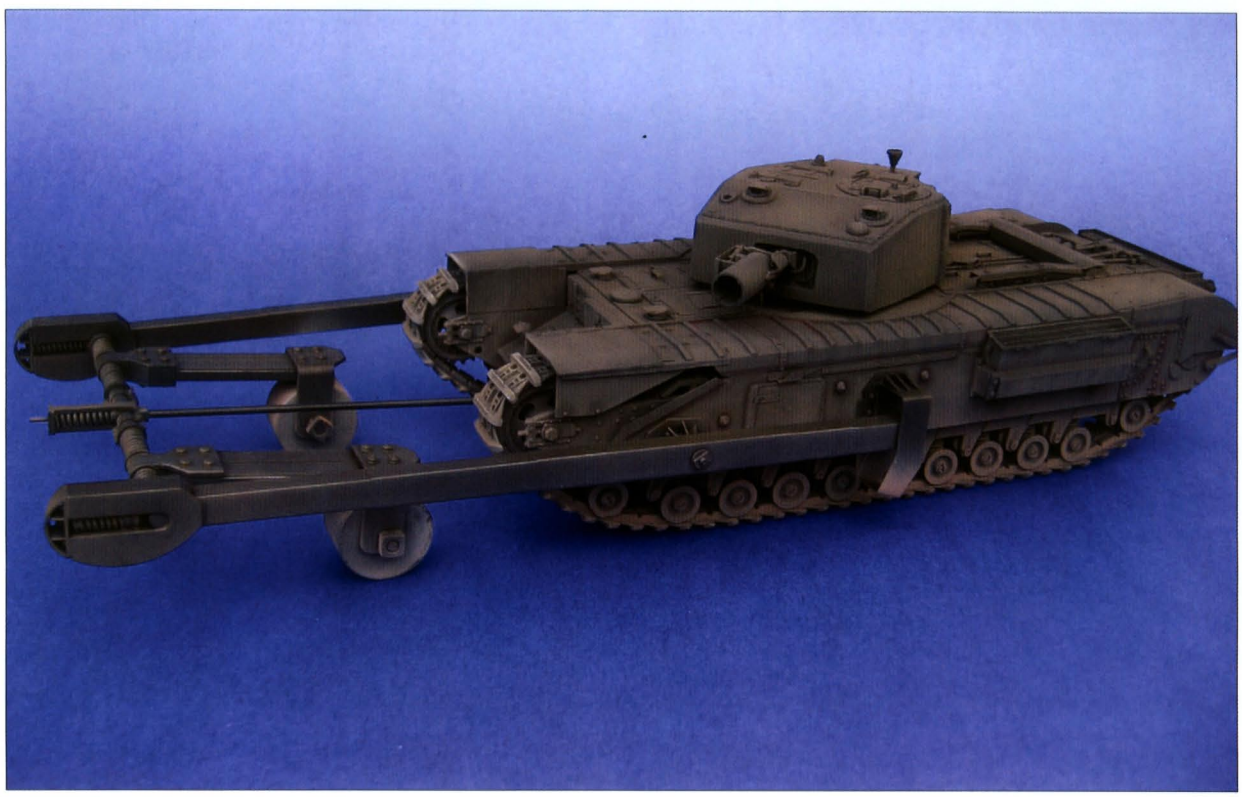
The CIRD complete. It comprises 177 individually lathed and milled parts from aluminium, brass and copper.

The CIRD project was entirely scratchbuilt by Daniel Munoz of Nuts'n'Bits using a lathe and mill. Daniel used Sherline machinery and constructed the 93 individual parts and 84 bolts that make up the CIRD from aluminium, and brass rod and plates. The AVRE Mk.III was built by Paul Fraser using the Tamiya plastic offering, the Legends AVRE conversion kit, Eduard photoetch and the Resicast turret.

The CIRD attached to the AVRE Mk.III via two arm supports affixed to the side hull.



BELOW The completed model.



Churchill Mk. I (twin howitzers), Tunisia 1943

Subject:	*Churchill Mk. I (twin howitzers), Tunisia 1943*
Modeller:	*Michael Rinaldi*
Base kit:	*Tamiya Churchill VII*
Scale:	*1/35*
Accessories:	*IMA conversion kit* *Tamiya paints* *MIG weathering pigments*

During a lull in the fighting in the North African campaign, several experiments were conducted on the Churchill tank. In one particular case, a Mk.I variant had its 2-pdr. gun removed and replaced by a second 3in. howitzer. This acted as a ranging weapon for the hull gun and allowed for greater indirect firing accuracy. IMA's conversion kit combined with Tamiya's offering were used to recreate this unique variant of the Churchill. Michael used post-shading, oil paint filters, pin washes, MIG pigments, and graphite to create this stunning finish.

The model was first sprayed in Lifecolour Brown and then post-shaded with lightened shades of the same colour. Heavy wear and chipping were applied using a kitchen scouring pad with Tamiya NATO Black.

Generic markings were made using a simple, white Prismacolour pencil.

Michael applied a layer of earth-coloured pigments prior to the filters on the hull sides.

The finished Mk. I.

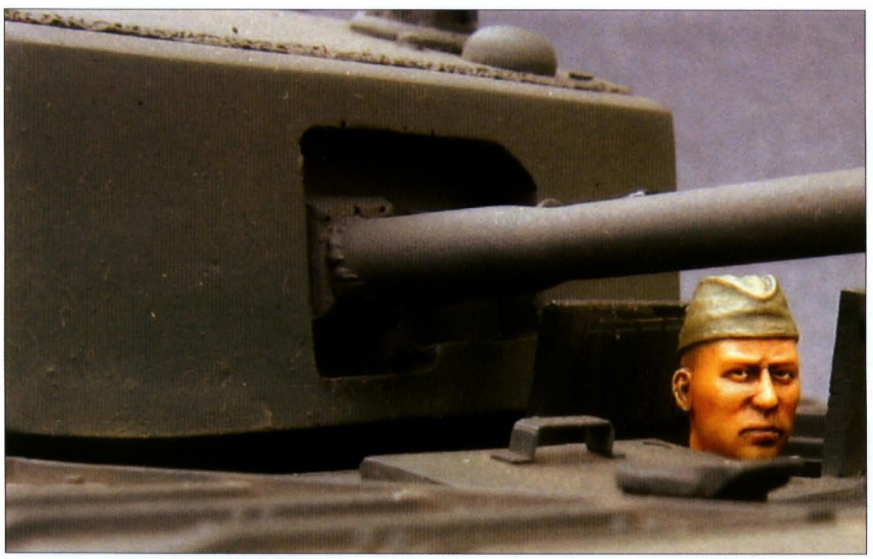
Churchill Mk.III, 5th Guard Tank Army (USSR)

Subject:	*Churchill Mk.III, 5th Guard Tank Army (USSR)*
Modeller:	*Mark Bannerman*
Base kit:	*Tamiya Crocodile*
Scale:	*1/35*
Accessories:	*Castoff Mk.III conversion* *Eduard photoetch detail set* *Xtracolour paints* *MIG weathering pigments* *Archer Fine Transfers*

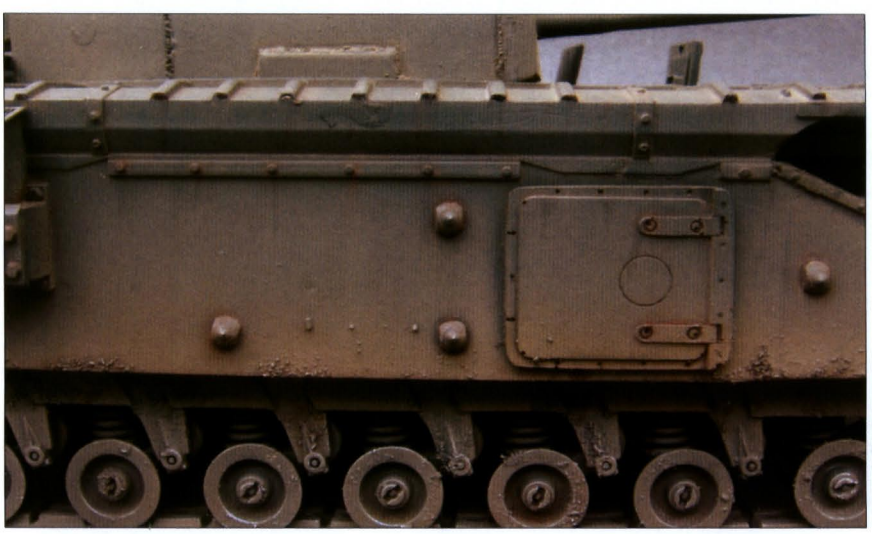
The British Army delivered to the Soviet Union approximately 300 Churchill Mk.IIIs, Mk.IVs and a handful of Churchill Crocodiles under the Lend-Lease initiative. This model represents a Churchill Mk.III of the 36th Guard Heavy Tank Regiment of the 18th Guard Tank Corps, 5th Guard Tank Army, at Prokhorovka in July 1943.

BELOW A composite by Ulf Anderson showing the Mk.III in action.

LEFT A right-side view of the completed model. Heavy pastels were used on the lower hull to create a dusty appearance.



BELOW LEFT A close up of the driver. Both figures were painted in oils and enamels.



BOTTOM LEFT A close up of the side hull. Note the three layers of mud and dust using lightened shades of Tamiya Dark Earth and Buff.

Further reading and research

Books

Ellis, Chris *The Churchill Tank*, Tanks Illustrated No. 23 (ISBN 0 85368 808 7)

Fletcher, David *British Tanks of WW2 (1) France and Belgium 1944*, Armour at War Series, No. 7027

Fletcher, David *Churchill Infantry Tank 1941–1951*, New Vanguard 4, Osprey Publishing (ISBN 1 85532 297 8)

Fletcher, David *Mr. Churchill's Tank*, Schiffer Military Publications (ISBN 0 76430 679 0)

Futter, Geoffrey W. *The Funnies* (ISBN 0 85242 405 1)

Henry, Hugh G. and Pallud, Jean-Paul *Dieppe through the Lens*, After the Battle series (ISBN 0 90091 376 2)

Tamiya Photographic Album No.3 *British Churchill Tank*

Other publications

Bellona: Print No 19 Mk.1 and 2 plans/details 1/76th.

Bellona: Print No 26 Mk.3, 4 and 5 plans 1/76th and 1/48th, photos, details.

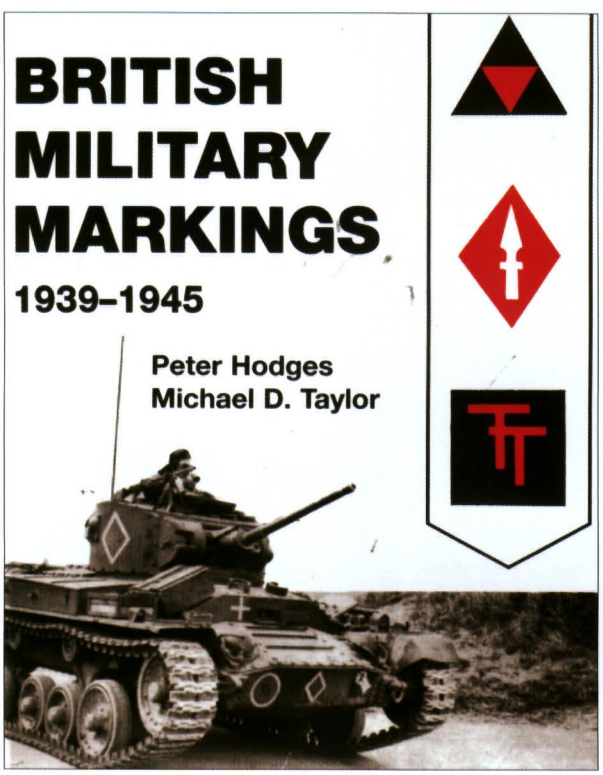
Museum Ordnance magazine: January 1993, article by Peter Brown.

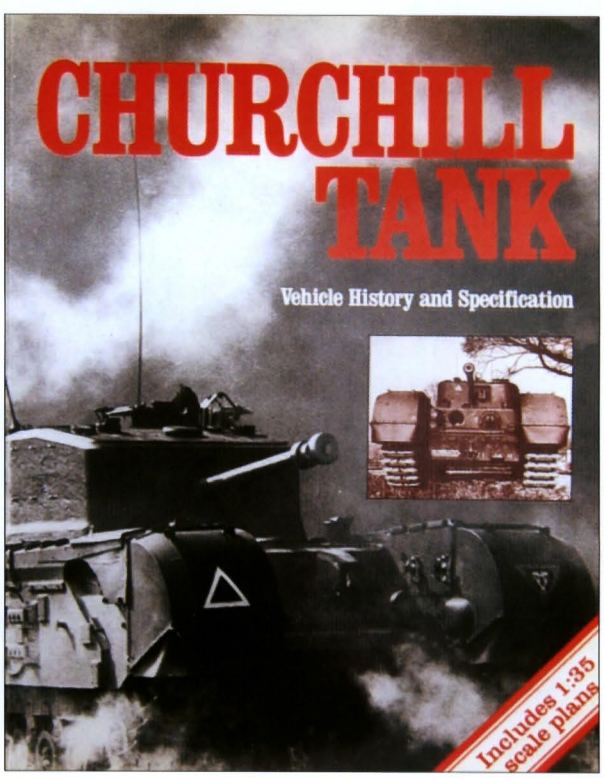
Military Modelling: Oct 95 (P36-42) Jun 94 (P42-49). D-Day tank units and vehicles by Les Neale.

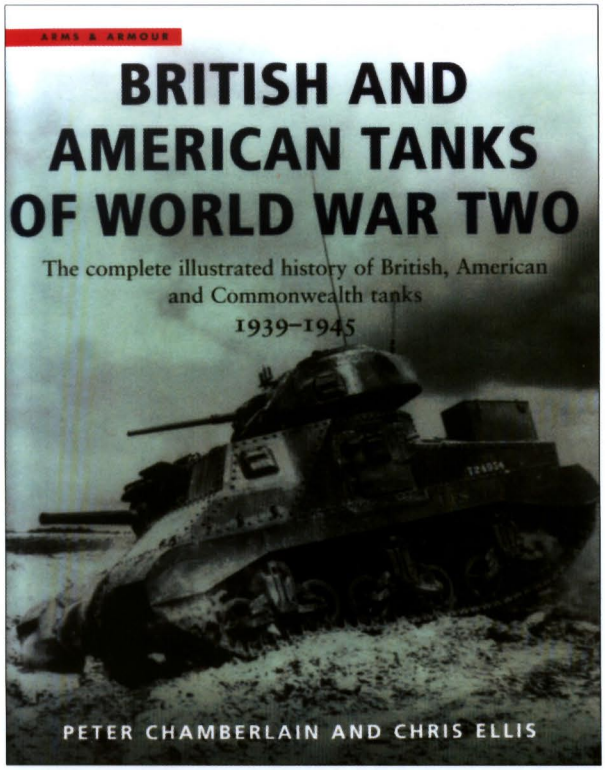
Military Modelling: Aug 1980, 1/35th log carrier; Sept 1976 1/35th SBG bridgelayer.

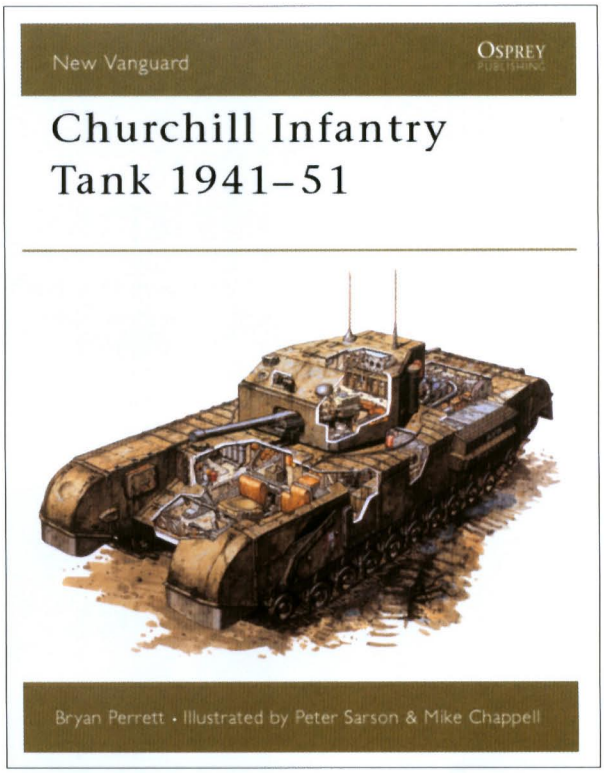
AFV News 1:35th scale drawings, by George Bradford.

RAC Tank Museum, Bovington: Plan Packs for the Churchill Mk.III.









Internet sites

Armour in Focus	http://www.armourinfocus.co.uk
Armoured Engineer	http://www.armouredengineer.force9.co.uk
REME	http://www.rangerover.f9.co.uk/REME
Liberation Photos	http://home.tiscali.nl/~jschoe

Various reference magazines such as *Military Modelling* and *Militaria*.

Kit and accessories available

Manufacturer	Scale	Type and part number
Castoff	1/35th	Churchill Mk.III conversion
Cromwell Models	1/35th	Mk.I/II full resin kit
Cromwell Models	1/35th	Mk.III full resin kit
Cromwell Models	1/35th	Mk.IV AVRE full resin kit
Cromwell Models	1/35th	Mk.V full resin kit[1]
Legend	1/35th	Churchill AVRE conversion
Legend	1/35th	Churchill NA 75 conversion
Legend	1/35th	Churchill Mk.V conversion[1]
Legend	1/35th	Churchill VIII conversion[1]
Tamiya	1/35th	Churchill Mk.VII British infantry tank Mk.IV (Kit No. 35210)
Tamiya	1/35th	Churchill Crocodile (Kit No. 3600)
Resicast	1/35th	AVRE conversion (Kit No. 35-119)
Resicast	1/35th	Churchill Assault SBG Bridge for AVRE (Kit No. 35-119)
Resicast	1/35th	Churchill Deep Wading Equipment (Kit No. 35-209)
E.D. Models	1/35th	Churchill Mk.IV (NA 75)
E.D. Models	1/35th	Churchill Mk.V (turret, front nose, side doors)
E.D. Models	1/35th	Churchill AVRE Turret
AL-BY	1/35th	Churchill AVRE Turret, Petard, Side Doors (Kit. No. 313-17)
Bauanleitung	1/35th	Churchill Mk.IV[2]
Bauanleitung	1/35th	Churchill Mk.IV (NA 75)[2]
Bauanleitung	1/35th	Churchill Mk.V[2]
Bauanleitung	1/35th	Churchill Mk.VI (EPHS 284)[2]
Accurate Armour	1/35th	Porpoise no.2 Mk.I, tank Ammo Sledge (A04)
Accurate Amrour	1/35th	Churchill AVRE Armoured Stores Sledge (A33)
Accurate Armour	1/35th	Churchill Tracks early heavy (AT4050)
Friulmodel	1/35th	Churchill Metal Tracks Workable Late (ATL 60)
Eduard	1/35th	Churchill Mk.VII (35-135)
Eduard	1/35th	Churchill Mk.VII and Crocodile (35-006)
International Models Asia	1/35th	Conversion Mk.I/ Mk.II
International Models Asia	1/35th	Conversion Mk.III
International Models Asia	1/35th	Conversion 3in.Gun
International Models Asia	1/35th	Conversion NA 75
Airwaves	1/35th	Churchill (35024)
Aurora	1/40th	Churchill Mk.III (315-129)
Matchbox	1/48th	Churchill AVRE Bridgelayer (PK 177)
Airfix	1/72nd	Churchill Mk.VII (no. 01304)
Hasegawa	1/72nd	Churchill Mk.I (no. 127)
Heller	1/72nd	Churchill (9884)
Ertl/ESCI	1/72nd	Churchill Mk.III.
ESCI	1/72nd	Churchill Mk.III, CIRD, Oke
Cromwell	1/76th	Churchill Mk.I (B39)
Cromwell	1/76th	Churchill Mk.II (B40)
Cromwell	1/76th	Churchill Mk.III (B41)
Cromwell	1/76th	Churchill Mk.IV (B42)
Cromwell	1/76th	Churchill NA 75 (B43)
Cromwell	1/76th	Churchill Mk.V 95mm (B46)
Cromwell	1/76th	Churchill Mk.VI 75mm (B47)
Cromwell	1/76th	Churchill Mk.III 75mm (B48)
Roco	1/87th	Churchill Mk.IV (Z-267)
GHQ Miniatures	1/285th	Churchill Mk.III (no. 10)
GHQ Miniatures	1/285th	Churchill Mk.VII (no. 55)

Notes

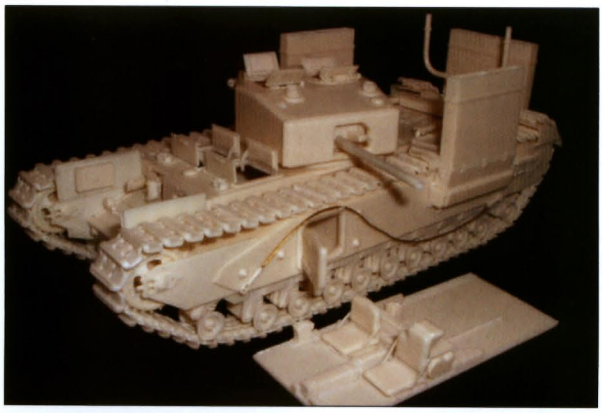
[1] Forthcoming release, announced at time of writing.

[2] Some of the above are out of production, but can still be purchased through various websites and specialty stores.

Tamiya's plastic 1/35th Churchill Mk.VII.

Tamiya's 1/35th Crocodile kit.

The conversion by International Models Asia for the 3in. Gun variant.



One of Cromwell's 1/35th-scale resin releases, the Mk.II.

Various after-market parts for the Churchill family: Castoff's Mk.III conversion kit; an Eduard photo etch set; Legend's AVRE conversion kit; and KK Casting's NA 75 kit.

Resicast's excellent 1/35th-scale resin AVRE conversion kit.

Tips and tricks

Tweak list: backdating the Tamiya offerings

The two Churchill offerings by Tamiya are very late variants of the Churchill (possibly based on Korean War variants) and several modifications are required to backdate these two kits to the earlier Churchill types. The following are the primary changes that need to be made. Please note that there are always exceptions and the following only serve as broad guidelines:

- Replace round side doors with rectangular side access doors
- Replace front hull nose for Mk.I to Mk.VI variants
- Replace driver's vision block with square port
- Change BESA aperture
- Add cone nuts to hull sides for Mk.II to Mk.VI
- Change front-end side plate on hull
- Remove middle periscope on upper hull
- Shorten two outer periscopes
- Replace turret depending on mark type
- Remove engine deck pole fixtures
- Add rivets along hull rim depending on variant after Mk.II
- Replace main armament
- Replace air intake (Mk.I/II had a different pattern from Mk.III–VI types)
- Replace tracks (depending on mark) with Riveted, Heavy or Light Cast Steel
- Add track support plates
- Replace grab handles
- Change cable support pegs on hull sides
- Fill in holes on upper track guards
- Remove the three rectangular flaps on each side air-intake
- Add mud chutes
- Replace rear vertical armour plate
- Remove telephone box for earlier mark types

Painting and weathering order

There are many painting and weathering techniques available to modellers; the array of methodologies and the order in which they should be applied can be bewildering. I have included here a 'step-by-step' list, which represents a combination and compilation of various approaches used by several well-known armour masters, including Tony Greenland, Mirko Bayerl, James Blackwell, Mike Nichols, Steve Zaloga and Mig Jimenez.

Although each of these modellers has a unique technique for applying paint and weathering, the chronology in which the finishing steps are applied is relatively consistent throughout. This chronological step-by-step is by no means the only approach, but is intended to serve as a guide. It should also be noted that several of the following steps are optional.

1) Dry mud	Optional. Use spices and liquid glue or Liquitex texture gel.
2) Prime	Two light coats.
3) Base coat	Two light coats. Add camouflage pattern if required.
4) Post-shade	Optional. Heavily diluted mix of black and brown.
5) Gloss coat	Recommended to protect base, but not necessary.
6) Decals/transfers	Allow decals to dry for several hours.
7) Pre-Dusting 1	Light spray of Tamiya Buff and/or Deck Tan to lower part of model.
8) Pre-Dusting 2	Repeat with light spray of Dark Brown.
9) Gloss coat	Optional, but recommended to protect base paint and transfers.
10) Filters	Three or four applications of 5 per cent oil/enamel mixed with 95 per cent thinners.
11) Rain marks	Optional. Tamiya thinners and Buff in a 9:1 ratio.
12) Pin-washes	Local application of Black/Brown oils mixed with thinners.
13) Soft dry-brush	Enamel base mixed with Flesh or White – moderate application.
14) Paint chips	Enamel or acrylic paint chips and scratches.
15) Rust streaks	Dry pastels drawn down from chips in Step 12.
16) Steel chips	2B pencil on a few high wear areas.
17) Dull coat	Optional. Light spray of semi gloss or matt coat.
18) Wet pastels	Dark pastels diluted with Tamiya thinners, brushed on bolts etc.
19) Dry pastels	Same as Step 18 without mixing in thinners.
20) Tools/details	Paint wood and metal parts on accessories.
21) Touch ups	Final touch up with pigments or pastels.

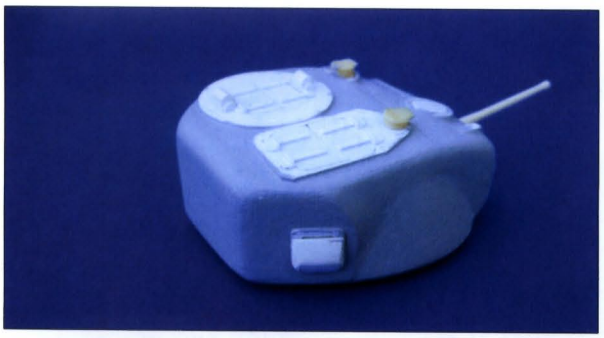
Scratch-building a Mk.I/II turret

This turret was scratch-built by Allan Crowther. The materials required include a 1in. fret-saw with an '000' blade, 0.25in. Intecel ABS sign board material, a fret-saw cutting guide, a clamp, and multiple copies of the turret drawing.

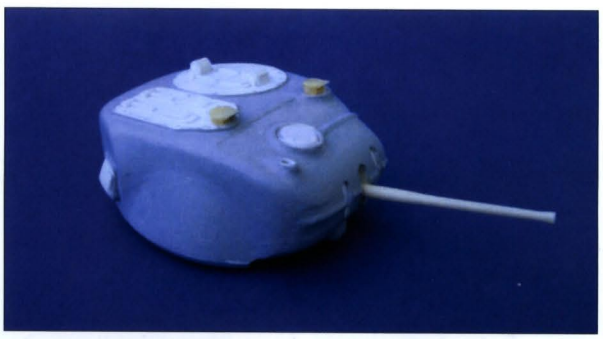
Allan cut out the outline of each layer using the fret-saw as well as the inside of the inner layers. All detail areas were also cut including the location for the hatches.

The layers were glued together aligning them carefully using the rear straight edge of the turret. The top of the turret should have a copy of the drawing and the bottom should have a mirror-image copy of the drawing.

A fret-saw was used to cut the taper of the turret from top to bottom. Allan also carved and sanded the turret to shape following the outlines on the top and the bottom. It is important to draw frequent reference lines to properly locate the major features. Milliput was also used to eliminate any carving gouges and fill the gaps between the layers.



Hatches and hinges were cut from sheet styrene. The bomb-thrower opening was made of a rectangular chunk of styrene faired in with Milliput. Openings for the gun, coaxial machine gun, and sight were drilled and filed to shape. The 2-pdr. barrel is an Ultracast offering.

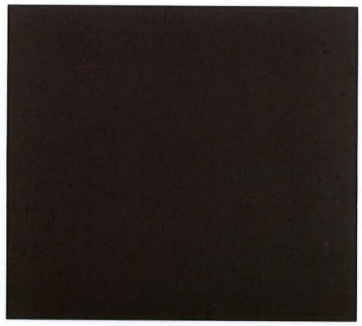


The turret was painted with several coats of Mr. Surfacer 500 to create cast texture. Once the Mr. Surfacer is thoroughly dry, the turret will be ready for primer and paint.

Index

A. Tamiya Khaki Drab (XF-51)

E. Tamiya Brown (XF-72)

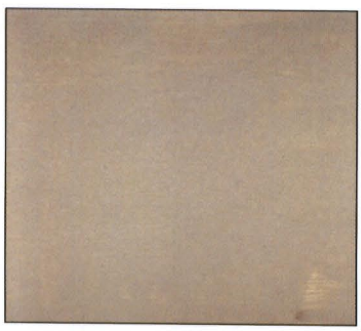


I. Vallejo German Grey (995)

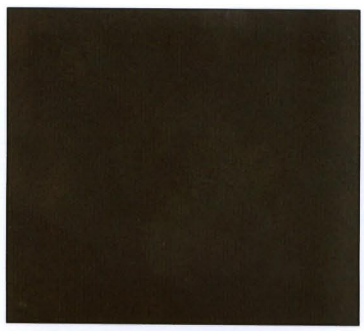
B. Tamiya Flat Earth (XF-52)

F. Polly Scale Pullman Green

J. Humbrol Matt Forest Green (150)

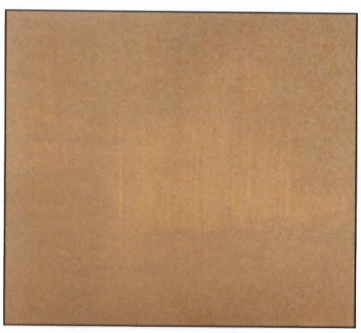


C. Tamiya Deck Tan (XF-55)



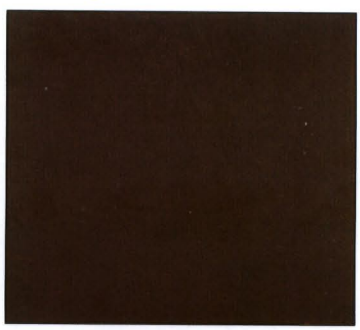
G. Xtra Color Bronze Green (X-814)

K. Humbrol Khaki Drab (159)



D. Tamiya Buff (XF-57)

H. Xtra Color Khaki Drab (X-816)



L. Humbrol Brown Bess (170)

I. Vallejo German Grey (995)

Most of the paints in this series were developed for figure painting, but there are a few excellent colours that can be used for depicting chips, dings, rust and peeling paint. I use this particular colour mixed with Vallejo Brown or Black to depict worn-off paint.

E. Tamiya Brown (XF-72)

This is one of Tamiya's later releases and I found this colour to be very effective in depicting darker dusts (such as in France or Russia during the summer months).

A. Tamiya Khaki Drab (XF-51)

This colour was used for several of the Churchills in this book and is a good representation of Commonwealth AFV colours. For airbrushing purposes, this paint should be mixed with 40 per cent Tamiya thinners or rubbing alcohol as an alternative.

J. Humbrol Matt Forest Green (150)

An excellent enamel colour for dry-brushing or filter purposes. Avoid putting excessive thinner agents in the tin, and use a toothpick to get to the thick residue at the bottom.

F. Polly Scale Pullman Green

The Polly Scale range of paints was designed initially for railroad modelling. This particularly colour is excellent for commonwealth vehicles. The ease of its application and its consistency makes it a very enjoyable paint to work with.

B. Tamiya Flat Earth (XF-52)

An excellent paint for depicting dried mud. It should be sprayed lightly on the lower half of the AFV and well thinned in a ratio of 1:4 paint to Tamiya Thinners.

K. Humbrol Khaki Drab (159)

This is the ideal paint for dry-brushing any surface that has been painted in either Gunze, Tamiya or Xtra Color Khaki Drab.

G. Xtra Color Bronze Green (X-814)

I have always worked with acrylic-based paints, and avoid using enamel paints as much as possible. However, I recently discovered the Xtra Color line, and wished I had tried these earlier. The series is simply superb, with many colours in the range. They are well researched, accurate in tone, extremely durable, and dry rock hard. Thin them down with XDTT Quick Dry Thinners by Xtra Color.

C. Tamiya Deck Tan (XF-55)

This colour makes for an excellent dusty appearance on AFVs, especially those vehicles serving in the desert or in dry climates (such as Italy).

L. Humbrol Brown Bess (170)

An ideal colour for depicting chips, rust, dings, scratches, worn leather, wood, boots and shoes, rifle stocks, and dirt. It also works well with a dash of lighter or darker enamel mixed in.

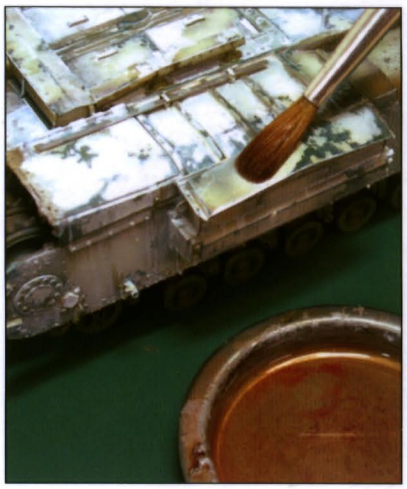
H. Xtra Color Khaki Drab (X-816)

These paints dry with a slight sheen and eliminate the need to apply gloss for transfers and for weathering purposes. However, it is important to ensure the paint dries thoroughly – usually 24 hours. These paints were designed for airbrushing purposes only.

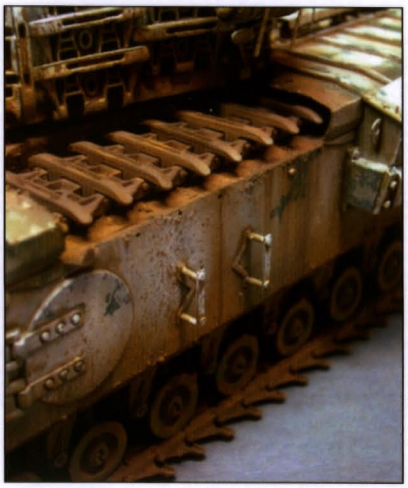
D. Tamiya Buff (XF-57)

This color is quite similar to Deck Tan (XF-55) and serves the same purpose of depicting dust. However, a light application of Buff followed by a similar application of Deck Tan creates a nice multi-layered effect on a vehicle.

Expert advice on how to get the most from your modelling



Step-by-step instructions



Unrivalled detail

Colour reference photos

Creative approaches to modelling

Modelling the Churchill Tank

The Churchill saw a large amount of action in World War II, from the 1942 raid on Dieppe, through the heat of the battles in North Africa, to the bitter fighting in Normandy 1944 and into the Reich in 1945. Despite criticism that it was slow and outmoded in terms of design, it proved itself a rugged and solid vehicle. This title provides a comprehensive guide to modelling the Churchill across a range of skill levels, featuring challenging builds of numerous marks and variants, including bridgelayers, flame-throwers (such as the Crocodile) and customised assault vehicles (such as the spigot-mortar armed ARVE). Scratch-building, painting, and weathering techniques are all covered, as are tips on vignette settings for your models.

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