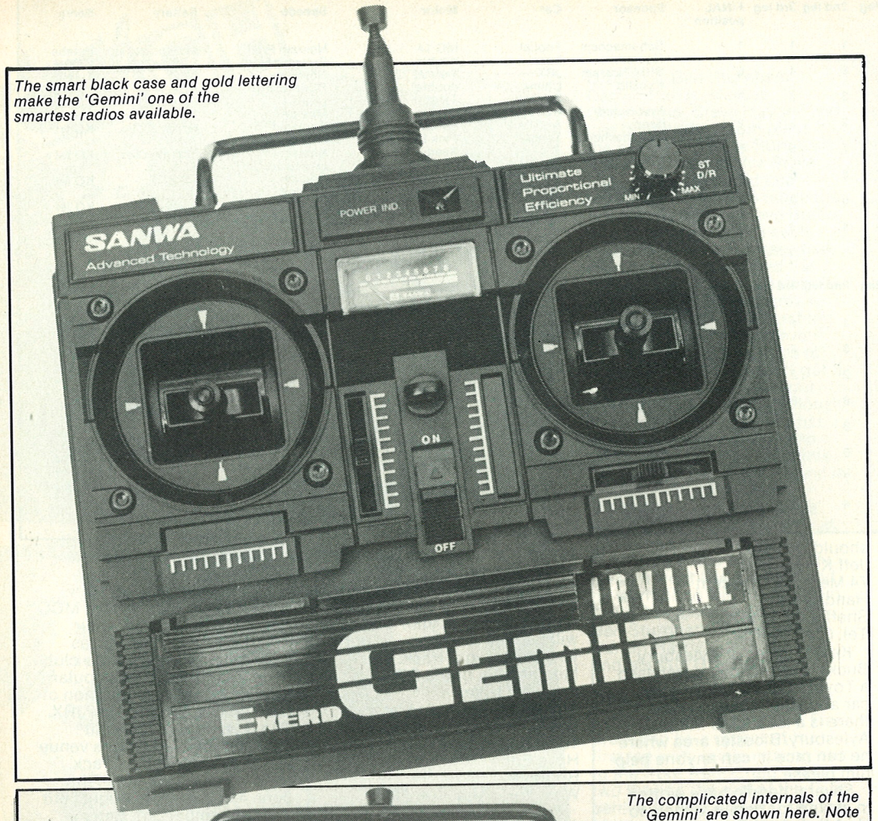
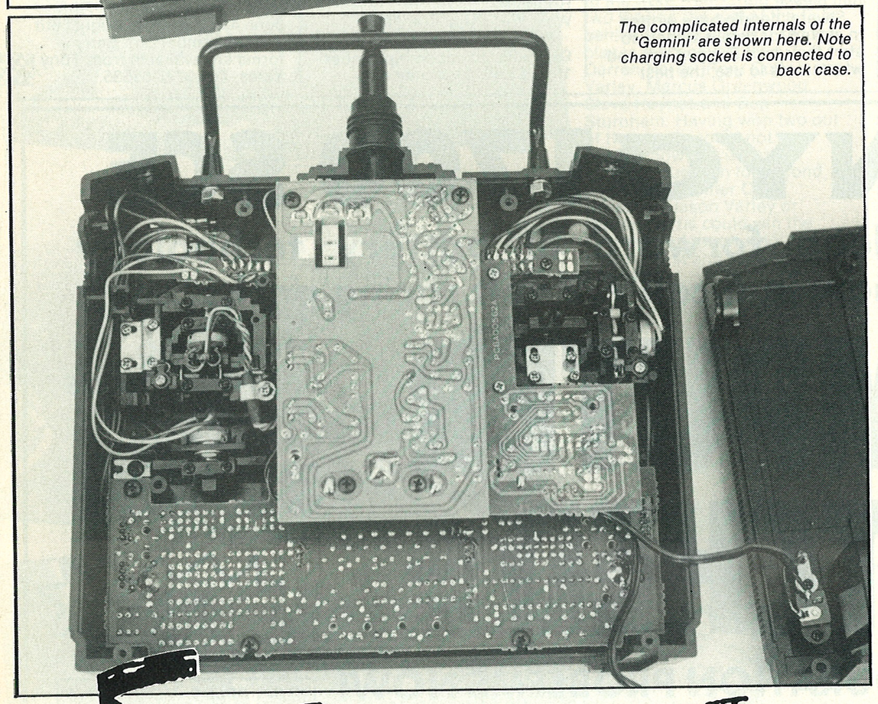


The smart black case and gold lettering make the 'Gemini' one of the smartest radios available.



The complicated internals of the 'Gemini' are shown here. Note charging socket is connected to back case.

SANWA GEMINI

Colin Leake reviews the all black Gemini from Sanwa

Many years ago, when we first started racing, tradition had it that if you drove a *PB* you used a *Futaba* 'Gold Set' and if you drove an *SG* you used a '*Sanwa* Excellence' set. That's what the works drivers used, and most of us followed suit. Thus it was that, since the lads drove *SG* cars, we started off with a couple of *Sanwa* sets. As time went by and we became more serious about our racing it became desirable to carry a spare set around with us. Unlike now eighth scale racing was then attracting few new drivers who would potentially purchase one of these top of the range sets. Despite several telephone calls from me trying to persuade them otherwise *Irvine* decided that it was not commercially viable to go on importing this set and they became unobtainable.

In order to get round the problem eldest son Steve changed first to a *JR* 'Apex,' and then later to a couple of *Futaba* 'Gold' sets, leaving his younger brother Shaun, in company with many other ex *SG* drivers, clinging stubbornly to his beloved *Sanwa* sets.

This year when looking at the equipment we would need for the coming season it seemed to me it would be better if the lads both used the same radio gear. As the 'Excellence' sets were about to start their sixth season I offered Shaun a shiny new set like his brothers. To my surprise he turned the offer down flat. His logic was simple and unarguable. In all the time he had been using *Sanwa* sets he had only twice had a receiver failure and, unlike his brother, almost never suffered from interference problems. They did all he wanted, so why should he change?

I actually had the spare transmitter packed up in a box ready to send off to *Irvine* for servicing when news reached me, via one Walt Bailey, that *Irvine* were importing a new top range 40MHz set known as the 'Exerd Gemini.' His description of the features that were incorporated in the set was enough to set me reaching for the hot line to RCMC Editor Alan Harman. "Bags I review the new *Sanwa* 'Exerd Gemini'." I blurted out, with all the sophistication you would expect from a grown man who spends his time playing with model cars. After confirming that the set was indeed being imported officially by *Sanwa* importers *Irvine*, with the back up of their very competent service operation, and that it would be made generally available, he agreed.

Thus it was that, after the longest preamble to any product review ever written, the postman arrived at my door with a shiny new set for review.

A new set!

Considering that this radio may be considered to be a top line set the package *Irvine* have chosen to put together is at the same time both unusual yet sensible. Up until now all such sets, *Sanwa* included, have tended to be sold with everything possible crammed in. The result being that one has often finished up with items that were not needed.

Irvine have chosen to market this set equipped for dry cell operation, but with provision made for *Ni-cad* charging for those who want it. Also included in the package besides the receiver are two of *Sanwa*'s basic 'SM 102' servos.

One's first reaction is that they are trying to pull a fast one, by making it look cheaper than comparable sets from other importers. No doubt, in this commercial world, that factor was taken into account. However when one considers it more carefully it can be seen as a most sensible approach.

Model shop proprietors are generally enthusiasts who want to give as good a service as they can to their customers, especially if you in turn adopt a polite and friendly attitude to them. If you want to go to *Ni-cad* operation, and I suggest you should, they will sell you a set of *Ni-cads* and a charger. If you don't want the servo's then most will take them out and adjust the price accordingly. Equally they would be happy to swap one for an electronic speed controller, or both for more specialist servo's with a suitable price adjustment. In other words you can finish up with precisely what you want. The extras you may need to buy though must be taken into account when comparing costs with other makes of sets. Even so you will no doubt arrive at the conclusion that the 'Exerd Gemini' represents very good value for money.

As an example of how this works, when I last bought Steve a set I finished up paying in the region of £200 for a combo (a combo is a complete set with no servo's). In amongst that I finished up with a mains charger I did not need and a set of receiver *Ni-cads* that would not even fit the car.

By contrast 'Exerd Gemini' effectively costs £101.00 with the servo's taken out making it possible to add two of *Sanwa*'s top flight ICBB.HS servos to the same package for roughly the same price I had formerly paid for Steve's combo. As we already had two *Sanwa* chargers I did not need another one. Actually in practice I never use a mains charger, preferring instead to use a fast field charger with a DVM, so that I know exactly how much charge I have put in. Our existing receiver *Ni-cad* packs could still of course be used and I suspect that I could have got away with using a transmitter pack from one of his old sets. In the event, since these were now six years old, caution got the better of me and I purchased one of the new '600MAHr' *Sanyo* transmitter packs from Phil Greeno.

What you get

On now to the hardware. The two servos supplied with the set are *Sanwa*'s basic plain bearing 'SM 102.' Although this is their basic servo it should not be underestimated. With an operating speed of 0.26sec/60deg, an output torque of 3.0Kg/cm, and a reputation for rugged reliability it is more than adequate for most purposes. In point of fact we started off in modelling using a similar set of servos from *Sanwa* some time ago. They survived six months stuck up a tree in a model aeroplane until the leaves fell off finally revealing its whereabouts. This was followed by a few months in a *Mardave* 'Maruder,' two years in twelfth scale stock cars and finally a brief period in IC powered boats. I seem to remember we sold them with the boats.

For those requiring more specialist servos *Sanwa* offer the SM401 lightweight miniature servo with an operating speed of 0.35sec/60deg and an output torque of 2.0Kg/cm for use in twelfth or tenth scale circuit racing. If like us, you are involved in eighth scale circuit racing then the 'ICBB.HS' servo with its double ballraces and coreless motor is the one to go for. This servo traverses 60deg in a remarkable 0.25 seconds and punches out a massive 3.6Kg/cm of torque.

I particularly liked the fact that it is just that little bit shorter than most, which makes it very easy to fit into the cars. I had just reached for a screwdriver, intent on taking the circuit board out to spray it with my normal tropicalised varnish, when I changed my mind. The sealing on the servo looked so good that I decided breaking the seal would be counter productive. I particularly liked the two piece case construction. Inevitably in our game it will be necessary to replace the output gears occasionally. At least with this form of construction it can be done without breaking the vulnerable seal round the lead. It also means that the seal at the bottom has been dispensed with, making the servo far less likely to allow water in.

The receiver included is *Sanwa*'s very compact 'SCR-3305RS' FM receiver. With measurements of just 47 × 23 × 29mm there should be no problems fitting this into any car. *Sanwa* have chosen to use the conventional built in plug sockets on this rather than follow the fashion set by other manufacturers and use fly leads. For my part I shall make up short fly leads that plug in so that in the event of a servo change being required I do not have to take the waterproofing off the receiver. It has to be admitted that this solution is not quite so compact as built in fly leads but it does have the advantage that if one lead is damaged it can be easily replaced and the receiver need not be sent away for repair.

Unlike many receivers these days this one does not have an inbuilt BEC (Battery Eliminator Circuit). It's an omission that is of little consequence since it is not needed on IC powered cars, or on any electric car, with which a set of this stature is likely to be used, an electronic speed controller incorporating a BEC circuit of its own would almost inevitably be used.

Most serious racers, who often travel round the country racing, take the precaution of carrying a spare receiver with them. With this in mind the fact that this receiver costs only £39.50 should be taken into account when looking at the cost of the package.

The aerial on the receiver is already sensibly short. Do not under any circumstances shorten it any further, or you will seriously reduce the signal strength it passes to the receiver.

Power required

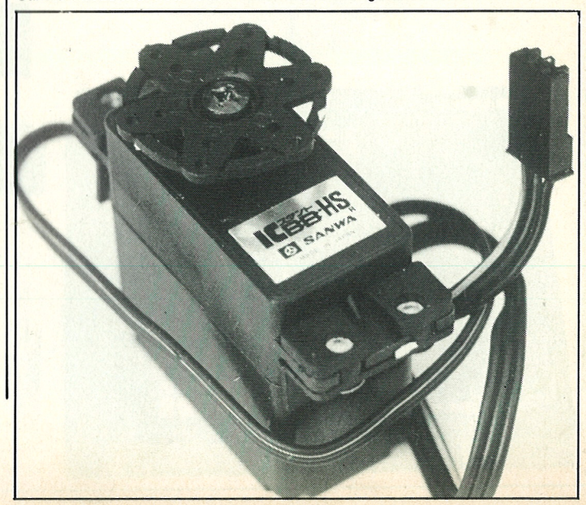
Since no receiver battery pack is provided it's a matter of either using dry cells, an existing pack or purchasing a new one. Whilst you may have in the past got away with using five cells on other makes of sets, especially if they are of older designs, you will not get away with it on this receiver. *Irvine* tell me that whilst they recognise that four dry cells produce six volts such cells have a higher internal resistance than *Ni-cad* packs. The truth of the matter is that this practice was common in the days of such servo's as the old '17M' when the extra voltage was needed to make them move fast enough. With today's modern high servo's with their coreless motors it is neither necessary or desirable. Their motors are all too easy to burn out with five cell packs and are very expensive.

Receivers with the necessary openings for the crystal and servo plugs are notoriously difficult to waterproof. Whatever precautions one takes some moisture always seems to find its way in.

Receivers with the necessary openings for the crystal and servo plugs are notoriously difficult to waterproof. Whatever precautions one takes some moisture always seems to find its way in. I was about to follow my normal practice, which has served me well for so many years, and give the circuit board a few coats of *RS Components* 'tropicalised varnish,' when I noticed what looked like a protective coat of some substance already on the circuit board. A telephone call to *Irvine* confirmed that this was indeed so. Given that they know what conditions their equipment will be subjected to, it's always been a source of amazement to me that manufacturers do not previously appear to have not taken this relatively simple step to protect their product. Well done *Sanwa*.

On now to the bit that differentiates top line sets from the rest, the transmitter. I've already mentioned that only a dry cell battery holder is provided with this set. It really is best, both on financial grounds, and in the interest of knowing that you have a fully charged battery at the start of a meeting, to change to *Ni-cad* operation as soon as possible. Since the transmitter is already provided with a charging socket this only entails a matter of fitting a pack of *Ni-cads* and obtaining a means of charging them. If you intend to use a pack from another make of radio equipment and or a charger do watch the polarity. I seem to remember for instance

Sanwa servos with neat rubber mounts and strengthened servo disc.



Belsport

TX 40.665MHZ

that the polarity on *Futaba* chargers is the reverse of that employed by *Sanwa*. Do not be tempted to purchase eight cheap *Ni-cads* and use them in the battery holder. Some are slightly shorter than the dry cells the holder was designed for. Even if they are not, if the batteries are left undisturbed in the holder the contacts will gradually oxidise over a period of time leading to a gradual deterioration in performance.

Black is best?

With this new set *Sanwa* have broken with the tradition of using a metal case for their flagship set. Instead they have used a smart black plastic one with the markings picked out in light blue, beige and gold. The unsual black antenna and a black metal carrying handle add the final touch to the transmitters already handsome good looks.

Set into the front is a large clear power meter with a very bright power on indicator immediately above it that should help to ensure the transmitter is never left switched on. Below this is a point to which a neck strap can be attached. The on/off switch being located immediately below this.

The very short control sticks are located nice and near the edge of the transmitter where they can easily be reached even by the shortest of thumbs. They may be adjusted to a longer length if required by removing the top of the stick and inserting one of the spacers provided on the stem before replacing it. Both control sticks are spring loaded as usual. What is unusual is the fact that the spring tension may be very easily adjusted by simply turning a screw until a setting to suit the user is found. By a clever arrangement of the linkage, through which the spring works at the back of the throttle servo *Sanwa* have contrived to make the resistance to movement of the control stick stiffer when pulled down to apply the brake, than it is when moved forward to operate the throttle.

The throttle control stick neutral position is slightly offset from centre so that the brake movement is shorter than the throttle movement. This position is fixed and cannot be dispensed with. However there is no reason why you should want to. Unlike certain other manufacturers *Sanwa* have not over done this bias. It all feels just right. One very much gets the feeling of moving the stick forward for the throttle and just pushing down for braking. Frankly on this set the stick movements felt more natural and comfortable than those of any other set I have ever handled.

Finally on the front we have the normal gliders, that almost all sets use to trim the servos, mounted to the side of and below the respective sticks.

Lift the hinged flap on the front at the bottom and the remaining features of the set are revealed. Those appertaining to the steering are set on a row across the top with the various throttle trims in a row below.

Working our way from left to right we start with a throttle reverse switch. Next we have an adjustment that is as far as know unique to this set. One of the problems that has often annoyed me in the past has been the need to set the steering servo in such a position that the servo saver is exactly central. Since its position on the output spline can only be moved several degrees at a time it is often necessry to take up much of the throttle trim's movement to achieve this. *Sanwa* have introduced what they call a steering sub trim which may be used to centralise the servo, thus leaving the main steering trim in its central position with a full range of adjustment available in both directions. Next come two pots that are used to independently limit the end of the servo travel to the left and the right so that the optimum amount of lock can be obtained in both directions.

More adjustments

To the right of this comes a pot that is used to adjust the amount of exponential on the steering. At first glance this appears to be a control many of us are familiar with, but it's not. *Sanwa* have once again broken new ground here. To the right of this control is a small switch labelled "Mild" and "Quick." With this switch set in the mild position the control acts as normal. That is to say as exponential is dialled in the steering becomes less sensitive about the central position. Move the switch to the quick setting and the reverse happens. As the amount of exponential is increased so the steering becomes more sensitive about the central position.

Finally before we leave the steering side of things a steering rate control knob is set high to the right on the front where it may be easily reached with the right forefinger without removing the thumb from the control stick. *Sanwa* suggest that the rest of the controls be set for normal dry driving conditions with this set to about 75%. Thus the steering can be made a little more sensitive if required or a great deal less if conditions deteriorate. No separate rate switch is provided. At first I thought this was something of an omission but once I thought about it I changed my mind. It's not often one needs to suddenly switch the rates in. If conditions change that much a tyre change would almost inevitably be needed as well.

For the throttle controls we once again start with a servo reversing switch, then moving to the right the next two pots control the end points of the throttle servo movements. Finally to the extreme right is a pot that dials exponential into the throttle servo movement. In the case of the throttle the switch that selected mild or quick on the steering control is omitted.

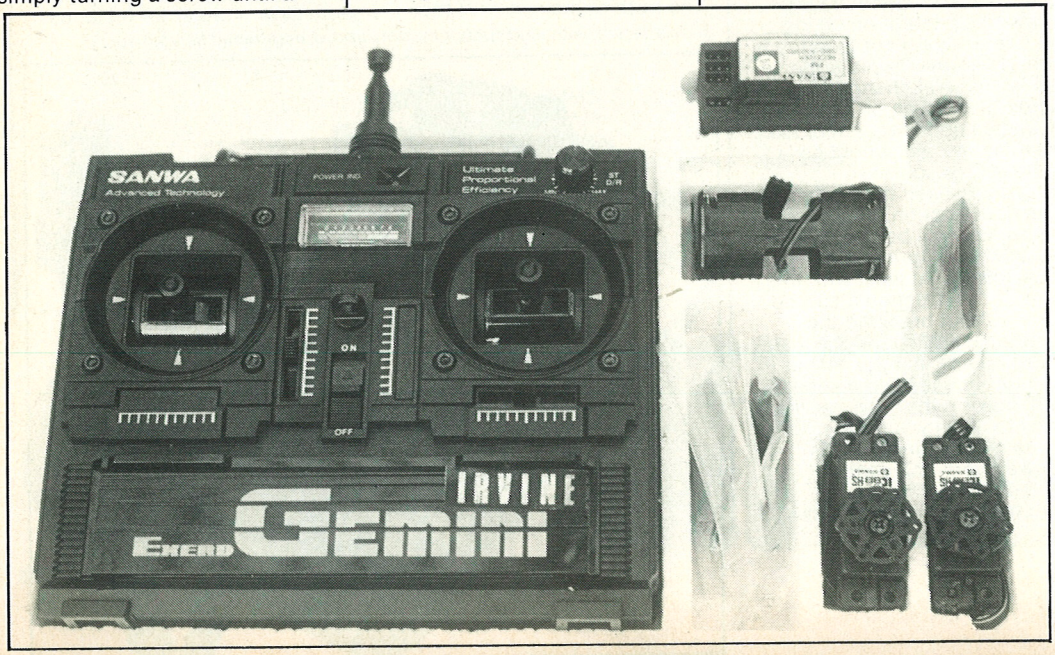
I was going to comment that it looked as if it would be very easy to carry out maintenance on the transmitter in the field. The potentiometers in particular looked very easy to replace. However *Irvine* pointed out to me that, with the ever increasing sophistication and miniaturisation of modern sets, many components are now used that are very susceptible to damage by static electricity. A statis discharge from an unearthed finger to a surface mounted chip, that may not even look like a chip, could be as devastating to it as a lightning strike on a golfer. The only difference being that whilst the odds are very much in favour of golfers they are decidedly loaded against the poor little chips! Come to think of it whilst I have had to replace pots on Steve's transmitters I have never had to replace one on Shaun's anyway.

There has been some confusion over the marking of 40MHz crystals from certain manufacturers, with drivers wandering round the pits trying to establish just what frequency they are on. Thankfully *Sanwa* have, as always, clearly marked both the transmitter and receiver crystals with their frequencies.

Packed with each set is an instruction booklet written in that charming brand of English that only the Japanese seem capable of. For all its quaint phraseology it is still crystal clear and very well illustrated. I was particularly pleased to see the diagrams at the end showing which wires are positive, negative and signal.

Having given the set what amounts to a rave review by my standards we come to what I regard as the only desirable feature *Sanwa* have omitted. Having spent years extolling the merits of a lead that can link the transmitter directly to the receiver, to enable servo's or linkages to be reset at a race meeting without having to turn the transmitter on, I feel let down by *Sanwa*'s omission of this highly desirable feature. I've been holding up *Sanwa* as an example to others in this respect, most of whom now provide such a lead. Really *Sanwa*. How could you do it?

We've not had a chance to try the equipment under race



Top: Belsport supply a Tx number board to show frequencies. Above: the set as it comes with everything included.

conditions yet, but as far as I can see it all seems to work well enough on the bench. I see no reason why it should not prove to be as reliable and resistant to interference as its predecessors. I'm told the Dutch *Serpent* Team have now changed over to using *Sanwa* radios which must mean something.

To sum things up this is a high specification set at a very attractive price. I have little doubt that we shall see many of them round the race tracks and that their owners will be very pleased with them. Certainly model shop proprietors are going to love its handsome and expensive looking appearance which will give it instant sales appeal. We may expect to see it very widely available.

Just one other thing is worth mentioning with regard to radio sets. There are some so called 'flakey' sets on sale. That is to say sets that have been imported by the back door and have not been subjected to type approval. Responsible importers such as *Irvine, MacGregor* and *Ripmax* etc. all submit their sets to 'ERA' for type approval.

In fact *Irvine* tell me that they regularly resubmit sets to this expensive process to ensure the manufacturer is maintaining sufficiently high quality standards. These responsible importers fix one of their labels to either the transmitter or the packaging so that if you buy one with such a sticker on you may be assured it is approved.

Our whole sport relies on each and every driver using radio equipment that conforms to the required standards and does not cause interference to others. Drivers that do not do so are acting in an irresponsible, selfish and short sighted manner. Make sure any set you purchase is approved. If it does not carry a lable such as I have described, or if you are in any doubt, ask the supplier if it has been type approved. Hopefully he will give you an honest and unambiguous answer. That way if you later find out it has not been approved, you can at least take it back and get a refund under the Trades Description Act!

Sanwa sets are imported by: *Irvine Engines, Unit 2, Brunswick Industrial Park, Brunswick Way, New Southgate, London N11 1JL.*

They are available from virtually all good model shops specialising in radio controlled cars.

The *Sanwa* 'Exerd Gemini' with two servos has a recommended retail price of £134.50. It should be possible to buy one as a combo for £101.00. *Sanwa Ni-cad* transmitter packs cost £19.50 and their mains charger £13.95. The standard 'SM102' servo is £16.75, the miniature 'SM401' servo £45.50 and the 'ICBB.HS' £54.50. Spare receivers are £39.50.