

So what do you get for your money?

Firstly it must be understood that for reasons that will become apparent during this review that the set comprises only of RX, nicaded TX and charger, switch harness & RX battery box, Direct Servo Controller (DSC) lead and manual. There are no servos included, these must be purchased separately. It is pointless to use standard servos with gear of this quality as will be seen later on. Two other facts need noting. This gear heralds the introduction of the new SANWA 'Z' connectors - see Fig.1. These achieve polarisation with 45° bevels on one side with the now common layout of the positive conductor separating the negative and signal leads. The second fact is the RX supplied for review is the new SANWA micro two function unit. The production M8 RX's will be slightly larger and three function to compliment the TX.

They look the same but are they?

Like the current breed of Formula 1 cars the basic shape of the current steerwheel radios all look the same at first glance. It is only when handling them and getting into the detail that you find where the differences are. The M8 is no exception. When picked up for the first time and with the aerial extended the TX is well balanced with the throttle trigger and steerwheel comfortably to hand. This can be further improved by adjusting the handle vertically to suit your hand size. A nice touch is the ability to 'twist' the top half of the unit through 180° for left handed operation. This is not difficult but does require care as you completely separate the two halves in the process with connecting wires between them. There is the usual steering wheel adjustment feature. All the operational features are on the steerwheel side except the On/Off switch on one end. Two operational functions, brake trim & steering dual rate, on the handle are duplicated either side for left or right hand working with the one side of the brake trim 'locked' out of use with a slip in plate. A thoughtful safety touch. The 'backside' carries the removable 40MHz RF module with the DSC jack socket located under the trigger end together with a plastic safety bung. A swivel neck or wrist strap point and matt chrome carrying handle are provided. A seven section bright chrome plated aerial is permanently fitted but I was disappointed that this was not matt black. There is a tendency to hold a steerwheel TX higher and at a different angle than a conventional stick TX with the result that the aerial is closer to the users face. In bright sunlight the reflection from a chrome aerial can be annoying at best and race losing at worst so that a matt black aerial is in my view essential for steerwheel TX's. The other spin off with steerwheels being held at a different angle is the better RF 'coupling' between TX and RX. TX aerials should never be pointed at the car as the RF radiation is weakest in this position. The TX batteries are located in the base with the charging socket at one end. Also

Hugh Bright reviews the newest Steerwheel radio - the Sanwa M8

Benchmark



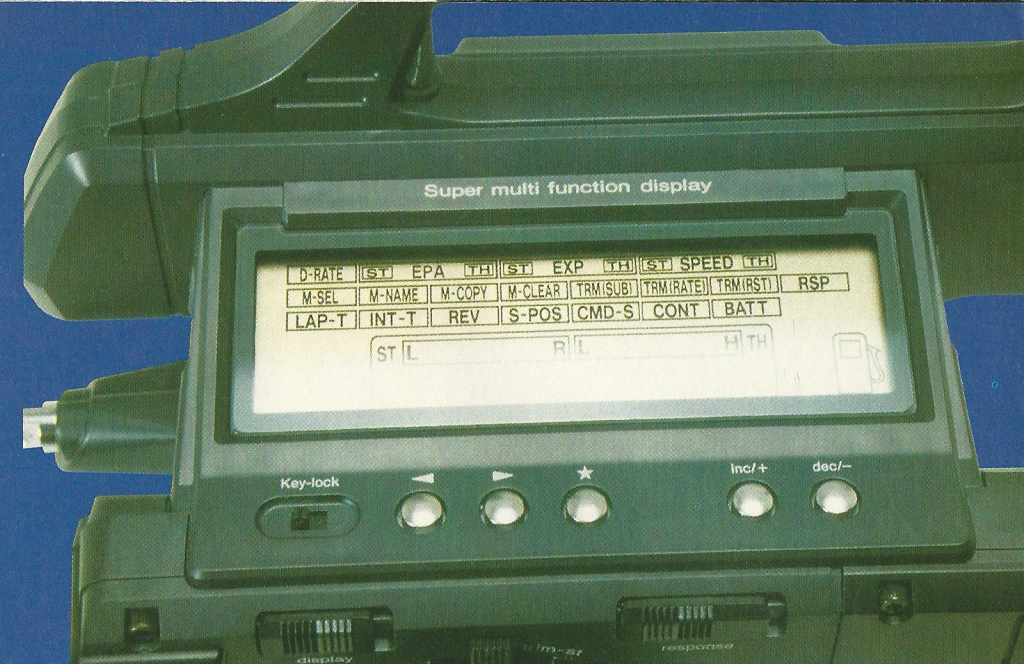
The Sanwa M8, comprehensive winner

serious specification!

at this end is the access to the battery compartment via the 'U' shaped end cover released by gently squeezing it at the open end and pulling free. The batteries are within a unit which automatically plugs into the TX when pushed fully home.

An overview

The pictures shows the layout of the display panel which is located above the steerwheel and at a shallow angle back to the rear housing. The effective size of 95x27 mm, is clearly laid out and comfortably viewable even in bright sunlight - a problem I've found in other computer radios recently. It is a multiple display with nineteen prime functions immediately available by scrolling round either way via the two LEFT-RIGHT Function Select buttons. If an asterisk appears in the display of your chosen function say REV (for reversing servos) then pressing the * button will gain access to a sub menu which in this example is each of the three function servos -Steering, Throttle and Function Three. Pressing either the INC+ or DEC- will program Normal or Reverse servo operation. It's that simple! So what is the point of a such a system? There are two answers to this not unreasonable question and both have a parallel to today's full size F1 scene. Both in miniature racing and F1 the object is to finish first without mishap using machines that have been designed with sophisticated tools and need to be 'set up' to a fine degree which only a few years ago would have been in the realms of science fiction. Add to this the need to be able to repeat/revise these settings to cater for weather and or track conditions over a 'stable' of cars it then becomes clear the first advantage of a computer RC system with a memory. The second advantage is the quite mind blowing accuracy and performance that can only be achieved in these 'set ups' if the correct servos are used. The reasons for using the recommended servos is that full advantage can be obtained of the extremely 'tight' RC link that exists between TX and RX with this gear plus the high speed of 0.06 Sec/60° with a torque of 7.2kg/cm at six volts. To illustrate the 'tight link' With standard servo/gear move the servo from centre to one end of its normal travel and back to centre and note the position. Do the same for the other end and you will find that the centre position is not always the same. This will occur at any point of the servo travel. There is nothing wrong with this tolerance - its just the 'price' we pay for mass produced economic gear. However with the M8 and the recommended servos, SANWA ERG-ZR, not only have you the speed and power above but they will



always position themselves precisely where you require them over and over again - a 'tight link'.

But just like the full size parallel between a production car and F1 they are not cheap. They will cost you RRP £129.99 each.

The M8 System features in detail

One is tempted with a review of this nature to report in detail the precise method of programming the system for all the features and alternatives if only to prove to the 'Ed' that the manual has been read from cover to cover and the system exhaustively explored! However I feel this is counter productive for you, the reader, when presented with a mass of detail which you can only fully appreciate if you have the opportunity of 'hands on' experience at the time of reading. Far better, I feel, for me to list the major System Features in Table 1. and at the same time enlarge and comment where appropriate.

The tight radio link is achieved using a narrow band FM TX/RX. The supplied manual is silent regarding technical specifications but bench tests confirmed the transmission system is PPM. This I found rather disappointing as previous sets of this quality have had the option of either modulation - PPM or PCM. It could be that SANWA consider their latest Pulse Position system is as good as a Pulse Code system. Only an in depth bench investigation, which has no place in a review of this nature, could prove the point.

I've already dealt with some elements of the systems infrastructure, case ergonomics etc., and these are backed up with the TX battery monitor which displays voltage digitally on 0.1 volt increments from 8.0 to 13.1volts. Couple this with an alarm which audio beeps when the battery drops to 9.1volts and emits a steady tone at 8.9volts the user has no excuse for TX battery failure.

Those astute readers, and that's all of you I'm sure, will have noticed the lack of further explanation against some of the features listed in Table 1. The first of these is 'Dual Rates'. The reason is that the manual claims this feature is available on both steering and throttle. I found in fact that DR was only on the steering function. The purpose is to correct an under or

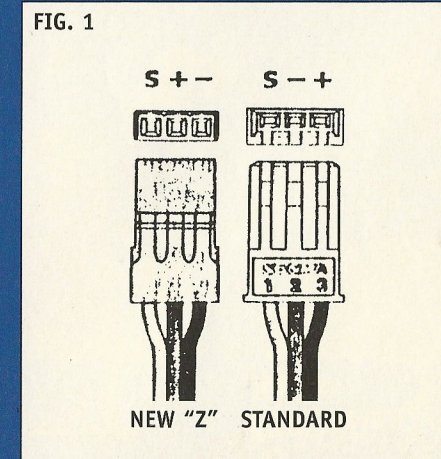
The LCD Display is very clear

over-steering condition and once set can be adjusted with your thumb via the Steering Rate Dial which is at the top of the handle. In setting up, this Dial has to be set to its centre position. As it is available either side of the handle (for left or right use) it is simple to centralise using the centre mark on the dial on the RF module side.

End Point Adjustment is available on steering to correct the turning radius if it differs left to right. It's simple to set up but bear in mind that the Steering Trim and the Sub Trim should be set up first and further if steering DR and EPA is set at 150% it may result in a servo centre 'dead band' i.e., lack of sensitivity. Throttle EPA adjusts the throttle arm stroke of IC engines and the maximum speed on an ESC and braking. SANWA recommends 100% for an ESC but 50 to 70% if a low power response is required. One word of caution here. If the servo throw is excessive it could stall, draw excessive current and possibly damage itself. At a servo price of £129.99 this should concentrate the mind when setting the braking EPA! The braking action can be adjusted when driving using the Brake Trim dual action micro switch with the 'handle' thumb. (The manual quaintly calls this the Brake Trim Wheel and is the function which is fitted with the locking plate mentioned above.)

Very useful

One of the most useful features of these 'new breed radios' is being able to modify the servo movement in relationship to either the



steerwheel or trigger movement - Steering or Throttle Exponential. Easily understood when I say that you can set your ESC throttle to achieve the soft start of your choice. Couple this feature with Servo Speed and you have complete control of either servo ensuring the most effective steering for whatever track conditions you find and conserve power with correct traction.

Sub Trims are available to readjust the Digital Trims to centre. These Digital trims can be finely adjusted to within one degree using Trim Rate. After running the car the trim settings are Auto Memorised.

Once programmed into one of ten memories all this data can be copied into any other memory of your choice or deleted as required.

Unique?

There is an operational feature, which SANWA claim is original and unique, is setting the servos Response Time which can be switched 'IN' or 'OUT' as required. There are twenty settings from +10 (Very Quick) to -10 (Very Mild).

Servo Reverse is available on all three functions.

The last operational feature is Starting Position which is for IC engines to ease starting by setting the idle higher. Once set above the normal idling position an alarm tone will sound. This feature can be switched on or off via a push button, S-pos, above the AUX FUNCTION knob to the left of the steerwheel. There is a comprehensive Timer Regime as listed in TABLE 1. You can also custom command the audio sound from a menu of ten tones and adjust the screen contrast.

Once the system has been set up the data can be protected from corruption by accidental manipulation of the various buttons/keys with a KEY LOCK. This can be seen to the left of the <- -> * buttons in the picture.

At the beginning of this review I mentioned the inclusion of a DSC (Direct Servo Controller) lead. This is a very useful piece of equipment and SANWA are to be congratulated in not only providing this feature within the design but also in including the wherewithal to use it - something which for some strange reason other makes in the past have not included the lead in the initial kit. Why am I so keen to see this provision? - in a word SAFETY. This feature allows the user to set up/modify the data between races WITHOUT transmitting and consequently being the cause of an accident. With

The rear view with the RF module removed



TABLE 1

M8 System Features

Narrow Band FM Receiver and Transmitter:

For the best possible radio link between the transmitter and your model.

New Airtronic 'Z' Servo Connectors: Allows connecting to components of most other brands without plug changes.

Transmitter RF Frequency Modules: Allows quick and positive channel and/or band changes, even between heats.

Three Channel Operation: For additional scale functions.

Advanced Case Ergonomics: For comfortable operation, well balanced with perfect wheel and grip alignment.

Adjustable Grip Length: Adjustable for any hand width.

Interchangeable Grip Position: For left or right handed users.

Steering Wheel Tension: Adjustable to exact point desired.

Rechargeable Battery.

Transmitter Battery Monitor: Displays battery voltage digitally in 0.1 volt increments from 8.0 to 13.1 volts

Transmitter Battery Alarm: Provides audio beeps when battery drops to 9.1 volts, steady tone when it drops to 8.9 volts.

Large Display Panel: High visibility, large characters.

Dual Rates:

Exponential: Available on both steering and throttle channels.

End Point Adjustments: Available on both

steering and throttle channels.

Digital Trim: One degree trim changes possible while running. Includes Sub Trim, Trim Rate, and Trim Reset functions.

Servo Speed: Steering and throttle servo speed variable.

Ten Model Memory: Stores all operational data for 10 different models. Includes Model Copy and Model Clear functions.

Response Switch: Adjust servo response time while under way.

Digital Timer: Multipurpose programmable timer can be set for total ON time, lap time, or as interval timer.

Servo Reverse.

Starting Position: Exclusive feature for glow engine powered models, sets the throttle at high idle for easier starting.

Command Signal: Selects one of ten different tones to be heard during any trim and function key operations.

LCD Contrast: Sets the brightness of the screen at the best level for different ambient lighting conditions.

Key Lock: Turns off programming keys to prevent accidental change or loss of stored data by inadvertent operation.

Direct Servo Controller: Allows setting of model linkages and all transmitter data without actual transmission taking place.

Fully Compatible: With all Airtronics accessories and most of those available from all major R/C equipment manufacturers.

'A superb set of gear with a very user friendly display and program'

DSC the TX is powered from the RX batteries with the TX switched off so that the user can happily 'tune' the data following track experience. For some unknown reason a different lead is required, Switch Harness No. 97031Z, for IC cars. I've assumed the one provided for the review is for electric power/ESC use. This query brings me to the only warts I've found during the review. The Manual! Why do importers persist in selling gear of this quality for serious money with a Manual obviously written for the American market and worse, not checking it for errors? It would be simple enough to amend page one to delete the 27, 75MHz and American FCC references and substitute 40MHz information and refer to our own JRCUC and the excellent RA60 Revision 5 - Radio Controlled Models Information Sheet - issued by the RADIOCOMMUNICATIONS AGENCY of the Dept of Trade & Industry. The safety aspects of using RC are excellent in page one. Page 6 - Replacing Crystals - has irrelevant and possibly misleading information as it deals only with the American requirements for 27 & 75 MHz bands.

Errors? Page 3 lists Dual Rates as being available on steering and throttle functions. DR is not available on the throttle function. It also lists Servo Reverse only on steering and throttle. SR is also available on the AUX Function.

Omissions. Eagle eyed readers will have noticed that I've not once during the review mentioned the red LED Power On indication.

This has been left to last as it plays an important part in the DSC working. This is when the system is fed from the RX batteries with no RF transmission and NO red LED alight, i.e. no red light - no transmission. A good safety feature. But there is one other condition when the TX is 'on' and no red light. How? To the left of the steerwheel and above it is a switch labelled display. Moving this to the right switches on the display and you have full operational control of the system but no transmission and no red light. Nowhere is this very useful facility listed in the manual.

Conclusions

A superb set of gear with a very user friendly display and program. The servo operation is very precise and fully justifies the price tag but potential users must ensure that the servo to function linkage must be of a very high quality as well to ensure all the benefits of the system are realised. But please IRVINE update and correct the manual to the same quality of the product. You then have a winner.

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Well that's it until next time - May Your Programmed RC Force Never Leave You. **RRC**