

The new Futaba 3VC radio

# Benchmark

Full size F1 Grand Prix racing has not been immune from the rapid growth of computer technology to the extent that the governing body has had to intervene to reduce the reliance of the drivers on computers/electronics and shift the balance back to driver's skills.

As I write the last Grand Prix in Argentina has demonstrated, during the practice sessions, this point with many drivers being unable to cope with a difficult track and spinning off. These thoughts have arisen during the preparation for this review as it became more and more evident that the 3VC is one of the most sophisticated sets of RC gear it has been my privilege to handle. Don't get me wrong. I'm not against progress where it contributes to safety and assists us all in learning our particular 'trade' whilst adding enjoyment every time we go out. What I'm questioning is the trend towards allowing the 'gear' to take over completely the necessity of 'driver skill' and the recognition of difficult track and driving conditions. It may sound daft but ultimately it could lead to setting the TX up, pressing a button and then join the spectators to watch all the transmitters battle it out on their own!! Is that what we all want? Think about it.

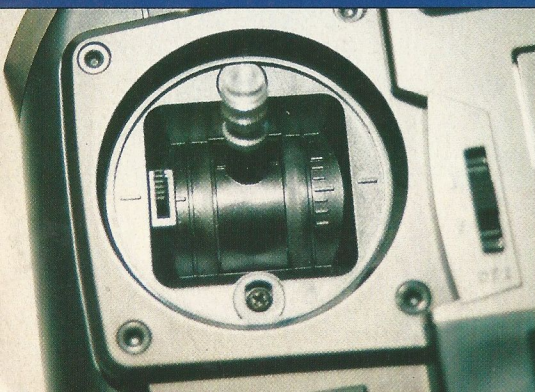
## First Impressions

The first thing you notice when picking up the 3VC TX is the solid comfortable 'feel' with the superb matt finish belying the fact it is a plastic moulding, albeit of the highest quality. Closer examination reveals it is two tone with the main casing black and the display and sticks surround gunmetal grey. Semi-hard palm grips greatly assist the TX in 'moulding' itself into your hands with the sticks and the other operating functions within easy reach. With the matt black aerial fully extended the whole is beautifully balanced, light in weight and

The multipurpose button pad



The throttle stick set at 5 degrees (max) horizontal adjustment



although supplied I doubt that the neck strap attachment would ever be needed. Stick length can be adjusted in the usual Futaba way by unscrewing the head and re-locking with the knurled 'under ring'. Short and long lever heads are available as optional extras. Both sticks spring tension adjustments are accessed by removing the palm grips. The throttle stick neutral position ratio can be selected mechanically, either 5:5 or 7:5, by a lever closely adjacent on the left hand side. The overall stroke of the throttle stick - mechanical ATL adjustment - can be to your choice by unscrewing either of the two Phillips screws above and below the stick. The top screw will reduce the stroke below neutral (brake) and the lower screw reduce the stroke above neutral (max speed). Both sticks 'mounting angle' can be adjusted approximately 5° horizontally by loosening the four set screws, adjusting and then re-tightening using a 2.5 mm 'across the flats' Allen key (not supplied). Finally both sticks can be converted from spring self return to ratchet operation using optional ratchet plates which must be ordered and purchased separately. I find this extraordinary that these, the Allen key and the long & short lever heads above, which must only be a few pence in cost, are not included in the set considering the overall quality and price of the gear. The rear of the TX locates the 40 MHz RF module and access to the battery compartment. One end has the Steering Dual Rate Buttons and the other end the Charging Jack and ATL Trim Buttons. More of these functions later on.

## What do you get?

The 'set' comprises of TX, PCM Micro RX, switch harness and charger. Servo/s and or ESC must be purchased separately. The TX comes with a 700mA/hr nicad. No RX nicad or battery box is included. The set is packed in the usual polystyrene tray and lid within a cardboard sleeve. A comprehensive manual is supplied but the user must appreciate that it is written for the American market and accept some of its contents accordingly. This brings us nicely to the review detail starting with the manual.

The 3VC, Note the small screen

## Manual labour?

As I said above the supplied manual is intended for the American market and as such the reader must allow for this particularly when reading the Operation Precautions. Most of these are applicable in the UK and its a great pity that similar text is absent from other manufacturers products. The disposal of 'dead' nicads is such a difference. You should already be aware of the arrangements in your locality and be guided accordingly. Note also that the 'Set' contents will differ from the manual as the TX has a Ripmax battery pack fitted, the two stick lever heads are already fitted, no RX battery box is supplied and servos must be purchased separately. If you are seriously contemplating this outfit then you must



## 'all singing - all dancing' DSC

"the 3VC is one of the most sophisticated sets of RC gear it has been my privilege to handle"

be prepared to pay serious money for either one or two servos if you are to reap the total benefit the system is capable of. Its been said many times in the mag' that sloppy mechanical linkage between servo and function creates sloppy response in car and driver. There is another linkage not often talked about - the electronic link between the TX stick and, via the RC transmission, the operating servo in the car. It's the 'tightness' of this link that underpins the quality of the 3VC system but, and it's a BIG BUT, only if top quality servos are used.

## Super Servo situation

The manual recommended servo is the S9402 and two of these were supplied for review. This servo is a serious animal indeed and a worthy partner to the 3VC. With speed of 0.10 secs/60° and torque: 111oz-in (both @ 6volts) powered by a coreless motor with hard coated aluminium metal gears and ball raced output this is the Rolls Royce of servos with an operating precision to be seen to be believed. It goes without saying that the servo mechanical linkage must be beyond reproach to justify the cost and use of the 9402. Also Futaba recommend the use of a high current nicad supply due to the 'very large current' the servo consumes to achieve its speed and torque.

Matching the servo quality the supplied RX is the PCM1024 (R113iP) 3 function Pulse Code Modulation micro unit measuring 42 X 28 X 15 mm and with its short aerial is ideal for cars. Previous production units had gold plated pins for additional reliability but this feature

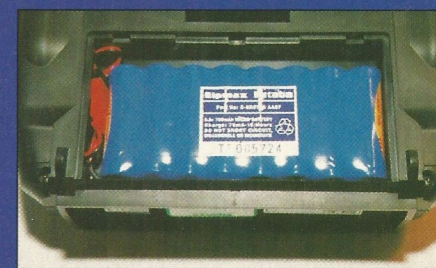
appears to have been deleted. This is a pity with this quality of gear and overall cost. Quality connections should be reflected throughout the RX/servo/battery/switch harness chain to reap the full benefits bearing in mind that the RX equipment works in a very hostile environment. Potential users of the 3VC system are well advised to bear this in mind particularly as the supplied switch harness appears to be the standard as supplied with more budget priced sets. The RX voltage of 4.8 to 6 Volts means that a six volt supply to gain the maximum servo speed and torque is practical either with a five cell pack nicad of 1700-

storage memory to sixteen. This is a well tried element of the CAMpac system which has been and still is featured in other Futaba TX's. The Pac is plugged into the front of the TX after removing the CAMpac protective cover. Both data memories are passive as they do not require a power supply. You can safely disconnect the TX power supply without losing any data. However you must wait at least two seconds before switching off the TX, if you have made data changes, to allow the new data to be written into the memories. Also the TX must be switched off when either installing or removing the Data Pac.

2000mAhr or using four AA size of the new rechargeable alkaline batteries - PURE ENERGY or RAYOVAC. With the ED's permission I'm hopeful of discussing these new rechargeables in the mag in the very near future. (Permission granted as they are worthy of investigation - I too have been having a play with these..... Ed)

## Data Pac

The last hardware element is the DP-16K Data Pac - an additional option which must be purchased. Without the Pac the RX will store data for up to eight R/C cars. The Pac extends the



The interior of the battery compartment, padding would make the nicad more secure



Close up on the Steering & Throttle trim settings above the TX voltage display

Lastly located on the right hand end is the Direct Servo Connection socket and just below the RF module on the back a Sound Port. This will accept a 3.5 mm earphone plug for the alarm tone which otherwise could be missed during noisy races etc., The remaining hardware details I'll cover as we discuss the programming and use of the 3VC system software.

## Setup

Although at first glance the setup and use of the system appears daunting it is quite straight forward as soon as you grasp some basic facts. First there are only two or three servos to program and then control! Secondly it is the relationship between throttle and steering that these servos control that the user is programming and this can be as simple or complicated as a choice. Thirdly that each car will have its own individual requirements and settings and these can be stored and called up as required. Couple this with being able to 'fine tune' the basic data with 'on track' experience and then store it for future use the benefits become all the more apparent.

### Let's start with detailing the main features.

1. There is direct access to the most frequently used functions via Three Function Selection Modes - Direct Mode - Select Mode and Set-Up Mode.
2. Second Dual Rate (D/R2) allows steering angle change with one touch whilst running.
3. Anti-Skid Brake System (ABS) which allows braking without loss of grip.
4. Traction Control (TRAC) eliminates wheel spin if the driver is too 'heavy' on the throttle stick.
5. START. This causes the throttle servo/ESC to move to a preset position for smooth acceleration and no wheel spin.
6. Steering Speed (ST.SPD) allows adjustment of the steering servo to match individual driving styles.
7. Both stick trims are electronic, digital and are constantly displayed on the screen. Secondary features include an Advanced Timer (TIMER) which when racing can record a total time and up to 99 laps. The timer can be stick activated with an alarm set from 30 secs before time is up. Practice target laps can be timed using the Navigation Timer.

## Start Here

Everything starts from the 'Initial Screen' display which occurs each time the TX is powered up. At switch on a tone sounds indicating power on with a Model No. displayed followed after approx. one second with the model name. After



The micro PGM1024 receiver

several seconds the display will switch to timer and TX voltage. This is the Initial Screen. From this screen the RF Output can be verified with the modulation, PPM or PCM checked. Both sticks have digital trims displayed and these can be set to the neutral or centre positions using the appropriate buttons. Steering dual rate and Throttle ATL are also displayed and operation of both sets of buttons checked. If this switch on is the first one after installation in a car then servo reverse can be implemented at this stage.

From the pictures six buttons can be identified below the CAMpac slot. Five buttons have dual functions with the sixth a single function - Direct Mode. Pressing this allows instant access to the five functions most frequently used via the other five buttons. Direct Mode Function shows how to 'scroll' round to select one of the other four from the first selection. Steering EXP is a typical example of what can be achieved. This function allows you to alter the amount of steering servo travel in relationship to the stick travel. The 'Quick' & 'Mild' graphs are self explanatory. As you adjust with two of the dual purpose buttons positive or negative the percentage amount is shown on the display. Arranged around the top half of the display screen are ten functions which from the initial screen can be 'scrolled' round using the 'UP' or 'DOWN' buttons. This is the Select Mode. The last Mode, Set-Up, is made up of functions that are not changed after basic setting and functions that are not often changed from the initial setting. To prevent accidents this separate menu is only accessed by pressing the two 'UP' & 'DOWN' buttons simultaneously again from the initial screen. Once into the function scrolling is again via the 'UP' & 'DOWN' buttons which includes SW1 - Function selection switch. At this point of the menu you can scroll using the SELECT button to SW2 then Custom Key and back to SW1. Switch 1, and Switch 2, are located either side of the display and the Custom Key is the bottom right hand button on the button panel. To suit individual requirements any of these three can allocated any function from those listed in Table 1. In a review of this nature its tempting to continue to report on all the many options that are available to the user. What I've done is to show the basic operations and leave the reader to obtain from the diagrams as much or as little he or she needs to form an opinion. The manual runs to 110 pages which give some idea of the extent of the options available. However I must mention the fail safe option available only in PCM mode. This allows all the servos to preset to a fail safe position in the event of loss of the RC link between TX & RX. It's the RX itself which is programmed and in the event of the link being restored the function is reset. Battery Fail Safe is also available in PCM mode. Once the RX battery drops below a specified value the throttle servo will move to the previous Fail Safe position but with one proviso. To my mind this will only be of use with a power supply that has a falling voltage discharge characteristic i.e., not nicads where the voltage remains virtually constant until just before final failure. When the battery recovers

the function is reset. There are mixing facilities between steering, throttle and Channel 3 functions which occupy six pages in the manual - far too comprehensive to include in the review. Lastly you can 'copy' the entire contents of one model memory into another memory, reset a memory 'en bloc' to the initial values excluding PCM/PPM selection, alter the tone of the audible warnings and change Channel 3 display to another function rate display. All the operations discussed above are of necessity a 'broad brush' review of the 3VC system but is enough to illustrate the potential that is there simply at the push of a button. But there are warts.

## Conclusions

Undoubtedly an extremely clever piece of equipment but as I said at the beginning where are these systems leading us? Like the curate's egg it's good in parts so lets look at the positive points first. It's one of the tightest RC links I've seen in many years of handling RC gear no doubt due, I'm convinced, to the marriage of the PCM1024 RX and the S9402 servos. The digital trims are superb. There are seventeen trim positions either side of each trim neutral with the servo moving on at each button press. A standard servo needed two presses before movement. The 9402 moved at every press either way. Very impressive (no pun intended!) Each trim position has an audible 'beep' with neutral having a double 'beep'. Once the three selection

modes principles are understood setting up is easy and straight forward. However whether all the various options, combinations and inter servo relationships are required is down to personal opinions. The degree of mixing is almost unbelievable but does underline the fact that to gain the ultimate benefit from the system all the linkages must be of the highest quality and beyond reproach. Negative points? - not many. The absence of stick ratchet plates and the Allen key I've already commented on. The display for me is too small and in bright sunlight difficult to read despite being able to adjust the contrast. A definite disadvantage when driving. I did not appreciate the TX battery rattling about within its compartment. Padding would not go amiss here. Having to remove the palm grips to access the sticks tension adjustment is not one of the 3VC's better design points.

Further details and local stockists from:- Ripmax Plc, Ripmax Corner, Green Street, Enfield, EN3 7SJ, tele. 0181 804 8272 - Fax. 0181 804 1217. The 3VC set comprising TX with nicad, RX, switch harness and charger is currently priced at £339-99. The S9402 servo in blister pack with mounting hardware and servo horns is, again currently, priced at £89-99 each. Our thanks to Ripmax for providing the sample reviewed here. As usual whatever you do, whatever gear you use, May Your RC Force Never Leaves You.

## Ripmax Reply

The padding Hugh mentioned is now fitted to all 3VC models. The switch harness used is considered good enough for the 9ZAP, a near £1K radio. The ratchet heads would add to the cost of the radio and are rarely specified by users. **RRG**

"the digital trims are superb"

TABLE 1

# Settable functions

### SWITCH 1

LAP:	Timer
THPR:	Throttle preset
TRC:	Traction Control
ABS:	ABS Function
IDLE:	Idle Up
D/R2:	Dual rate switching
PMX1:	Programmable mixing 1 On/Off
PMX2:	Programmable mixing 2 On/Off
OFF:	(Not used)

### SWITCH 2

TRC:	Traction Control
ABS:	ABS Function
IDLE:	Idle Up
D/R2:	Dual rate switching
CH3:	Channel 3
PMX1:	Programmable mixing 1 On/Off
PMX2:	Programmable mixing 2 On/Off
OFF:	(Not used)

### CUSTOM KEY

SUBT:	Sub trim
STSP:	Steering speed
ABS:	ABS Function
IDLE:	Idle Up
ACCE:	Throttle acceleration
STAR:	Start

TRC:	Traction Control
STEP:	Step
TIME:	Timer
NAME:	Model Name
STEX:	Steering EXP
THEX:	Throttle EXP
MSEL:	Model select
ATV:	ATV
D/R:	Dual Rate
ATL:	ATL
P3CH:	Channel 3 position
TH.N:	Throttle Neutral
PMX1:	Programmable mixing 1 On/Off
PMX2:	Programmable mixing 2 On/Off
TILT:	Tilt mixing
REV:	Servo reverse
BT1:	Function select dial
SW1:	Function select switch
F/S:	Fail safe
BF/S:	Battery fail safe
MOD:	PCM/PPM select
CONT:	LCD Contrast
ALRM:	Alarm on/off
MRES:	Model reset
MCOP:	Model copy
THCV:	Throttle curve
DSP3:	Channel 3 display