Service:

Belgique	Jean Marie Servais, Jambes	081-304564
France	Claude Hubscher, Strasbourg	03-88411242
Deutschland	MULTIPLEX Service, Niefern	07233-7333
Nederlande	Jan van Mouwerik, Maasland	01-059-13594
Österreich	Heinz Hable, Wien	0732-321100
Sverige	ORBO, Solna	08-832585
Schweiz	Werner Ankli, Zullwil K. Elsener, Basel	0691-7919191 061-3828282

MULTIPLEX *modelltechnik gmbh • Neuer Weg 15 • D-75223 Niefern*

85 5691

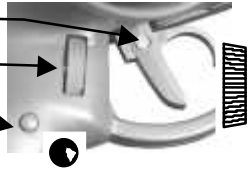
PROFI CAR 301

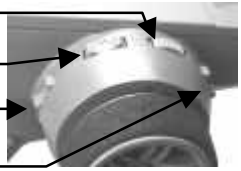
GB Operating instructions 21

MULTIPLEX®

Vista generale Vista general Vue d'ensemble Overwiew Überblick

I	E	F	GB	D
Tasti dei menu	***Teclas del menú***	***Touches de menus***	***Menu buttons***	***Menü-Tasten***
Grilletto	***El gatillo***	***La gâchette***	***Trigger duster***	***Abzug***
Vite del grilletto	*Tornilla*	*Vis de réglage*	*Loop screw*	*Bügel-Schraube*
Regolatore digitale	*Regulador digital*	*Souris*	*Digi adiustor*	*Digi-Einsteller*
Tasto	*Tecla*	*Bouton poussoir*	*Handle button*	*Griff-Taste*
Le trim	***Los trimados***	***Les trims***	***Trim rockers***	***Trimm-Wippen***
Sterzo	*Direcciòn*	*Direction*	*Steering*	*Lenkung*
Gas minimo	*Gas ralenti*	*Gaz ralenti*	*Idle trim*	*Leerlauf*
Bloccaggio freno	*Bloqueo freno*	*Blocage du frein*	*Brake lock point*	*Blockierpunkt Bremse*
Canale aggiunt. 3	*Canal adicional 3*	*Voie aux. 3*	*Aux. channel 3*	*Zusatzfunktion*
Ripetitione *Ripetitione automatico si vengono premuti per più di 1 sec.*	***Repeticiòn*** *Repetición automática cuando pulsada más de 1 segundo.*	***Repetition*** *Repetition automatique si enfoncée plus d'une seconde.*	***Repeat function*** *Automatic repeat when held pressed for longer than 1 sec.*	***Wiederholfunktion*** *Automatische Wiederholung wenn länger als 1 sec gedrückt wird.*





Vista generale Vista general Vue d'ensemble Overwiew Überblick

(I)	(E)	(F)	(GB)	(D)
Display	*Display*	*Display*	*Screen*	*Display*
Antenna (avvitata)	*Antena (atornillada)*	*Antenne (vissé)*	*Aerial (screw fitting)*	*Antenne geschraubt*
Tasti die menu	*Tecla del menú*	*Touches de menus*	*Menu buttons*	*Menü-Tasten*
Modulo	*Módulo HF*	*Module HF*	*RF module*	*HF-Modul*
Quarzo radio ***ATTENZIONE Utilizzare solo quarzi originali MULTIPLEX***	*Cuarzo de la emisora* ***!Atención! Usar solamente cuarzos originales de MULTIPLEX***	*Quartz d'émission* ***ATTENTION! N'utilisez que des quartz d'origine MULTIPLEX***	*Transmitter crystal* ***CAUTION! Use only genuine MULTIPLEX crystals***	*Sender-Quarz* ***ACHTUNG! Nur Original-MULTIPLEX Quarz verwenden.***
Presa per carica	*Casquillo de carga*	*Prise de charge*	*Charge socket*	*Ladebuchse*
Interruttore Acc./Spento	*Interruptor de ON/OFF*	*Interrupteur Marche/Arrêt*	*ON/OFF switch*	*Ein/Aus-Schalter*
Batteria radio nelle parte inferiore ***Con protezione termica!***	*Batería de la emisora en el pie* ***Con seguro térmico!***	*Accu d'émission dans le pied* ***Avec sécurité thermique!***	*Transmitter battery in base* ***With thermal fuse***	*Senderakku im Fuß* ***Mit Thermosicherung!***

Ladebuchse
Charge socket
Prise de charge ***600 mA max.***
Casquillo de carga
Presa di carica

Contents

Dear customer,
Dear fellow-modeller,

We are delighted that you have decided to purchase a MULTIPLEX radio control system.

Your PROFI CAR 301 has all, what's needed for ON- or OFF-ROAD models in 1:12, 1:10 and 1:8 scale.

Hardware, design and operation philosophy are the same as in the two „big" radios (PROFI CAR 403 and 707). Modifications have been made only, where required by an optimised user-friendliness.

We wish you many hours of pleasure with your PROFI CAR.

Yours - the ***MULTIPLEX*** *team*

1. Safety

Radio-controlled models are not playthings!

The most important contribution to operational security and safety is your own: all you have to do is handle your radio control system and model with due care and in a responsible manner.

- Check all electrical and mechanical connections in the model at regular intervals.
- Check regularly that all working parts are free-moving and devoid of slop.
- Carry out regular range checks (➔ 13.2, page 18).
- Before you switch on, ask other modellers at the trackside which channels are already in.
- Extend the transmitter aerial to full length before running your model, and check that it is firmly seated and in good condition.
- Check that you have selected the correct model memory for your model.
- Check all **working systems** before each run**:**
  Are the servos moving in the correct direction?
  Are the control travels set correctly?
- Are the transmitter and receiver batteries adequately charged, and in serviceable, well maintained condition?
- Use **genuine MULTIPLEX crystals, batteries and accessories** exclusively**.**
- If any components of your receiving system are not covered by this manual, read carefully the instructions supplied with them.

If you are in doubt about anything - don't run your model. Check everything again in peace and quiet, and locate and eliminate the cause. If you cannot solve the problem, you will find your model shop and the MULTIPLEX Customer Service department ready and willing to help you.

Read the notes in Section 13. concerning using the system!

2. Features and specification

Trigger

Servo - NORM, TRAVEL and CENTRE
EXPOnential effect for THROTTLE/BRAKE (progressive/degressive)

Steering

Servo - NORM, TRAVEL and CENTRE
EXPOnential STEERING curve (progressive/degressive)
MINimum TRAvel minimum steering travel

Timer

TIMER (stopwatch) ON or OFF
SIGNAL function for stopwatch
Checking and erasing the OPERATING HOURS TIMER

„Onboard toolbox"

Selectable TRIM effect (fine/medium/coarse)
Selectable screen TEXT language (G, GB, F, I, Sp)
Transmitter NAME (owner's name)
Battery monitor ALARM threshold
Servo 3 TRAVEL and centre (auxiliary function)
Servo 3 NORM mode (3 positions/flash/proportional)
Select modulation (AM/FM) for active model memory

3 model memories

GO TO a different model memory (change memory)
Enter model NAME
ERASE All (reset model memory)

Mechanics

Adjustable trigger, steering wheel with high-grip lining
Ergonomic controls in handle
Clearly arranged screen, angled towards the driver

Light weight	~ 600g incl. battery
Dimensions (W x H x D)	175 x 210 x 75 mm
Operating temperature range	-15° C – +50° C

Signal transmission

Three channels (steering, throttle/brake, auxiliary function)
Selectable FM / AM modulation for each model memory
Plug-in RF module (40/41 MHz and 75 MHz))
Externally accessible plug-in transmitter crystal

Power supply

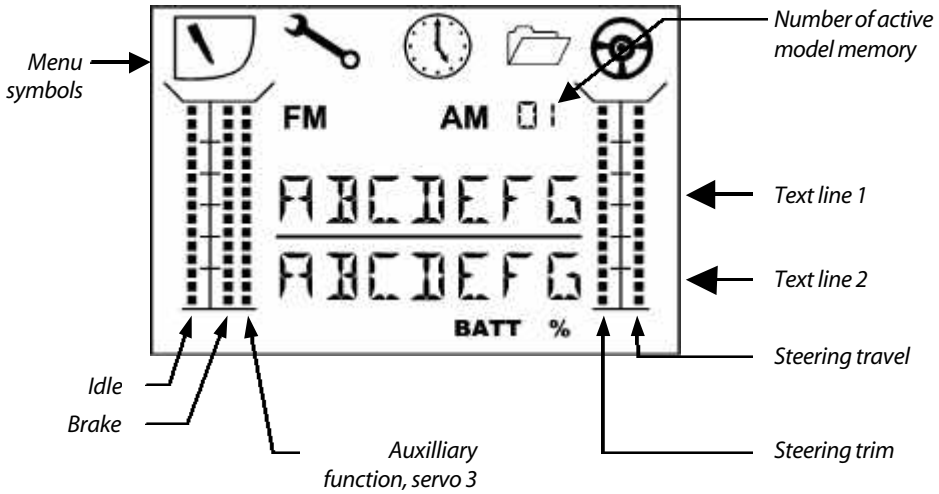
600 mAh, 6 cells battery
Charge socket in base. Battery includes integral thermal fuse

Current drain	~ 190 mA (~ 25 mA excl. RF module)
Operating time with 600 mAh battery	~ 2:45 hr
Variable battery alarm threshold	6,8 V to 7,2 V

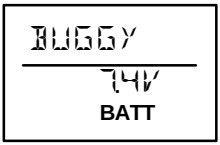
3. The “instrument panel” (screen)

The illustration below shows everything that the screen can display. What you actually see at any one time depends on whether the stopwatch is active, and whether you are currently programming the transmitter or using it.

You will find a few examples below the illustration.

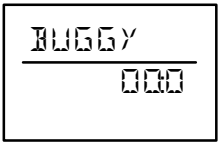


Operating screen



Timer: OFF

If the stopwatch is not active, the first text line on the screen shows the model name you have entered. Text line 2 shows the operating voltage.



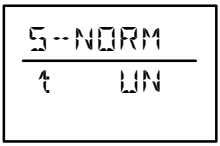
Timer: ON

The second text line displays the stopwatch. The timer is started and stopped using the handle button. Holding the button pressed in for longer than 1 second resets the stopwatch to 00.0.

Special case: battery alarm with timer active

If one of the timer modes is active and the battery voltage falls to the alarm threshold, the screen displays the current time and battery voltage together with BATT, alternating at 2 second intervals.

When programming the transmitter



When you are setting up the transmitter the first text line shows the selected menu point (example: signal norm for servo 1). The second line displays additional information, and the value you have set or selected.

4. The basic principles

The five menu buttons of the PROFI CAR are the key to all the adjustments you can make. The symbols tell you the menu points to which each button provides access.

Menu button	***Menu function***
	TRIGGER Everything to do with throttle and brake NORM, CENTRE, TRAVEL and EXPO for the THROTTLE/BRAKE servo
	STEERING Adjust steering to suit the track / vehicle / driver NORM, CENTRE, TRAVEL and EXPO for the STEERING servo
	TIMER Switch stopwatch ON or OFF, set signal time Check and erase operating hours timer
	TOOL Basic transmitter settings Set servo 3 mode
	MEMORY Change, assign name, erase

Once you have found your way to the appropriate menu point, you use the digi-adjustor and the handle button to complete the process.

	DIGI-ADJUSTOR Set values (travels, times, ...)
	HANDLE BUTTON Confirm erasure and memory change (hold pressed in for longer than 3 sec.)

Return to the operating screen; press any menu button other than the one you last used.

When you see the operating screen (i.e. when you have completed your adjustments), the functions of the handle button and the digi-adjustor are as follows:

	HANDLE BUTTON Operate stopwatch (if active)
	DIGI-ADJUSTOR Adjust steering travel

5. Switching on for the first time

5.1. Charging the transmitter battery (maximum charge current 1 A)

First connect the charge lead (Order No. 12 5023) to the charger, then connect the charge lead to the transmitter.

Charging - important:

· Automatic battery fuse

The battery in your PROFI CAR features an integral thermal fuse which protects the pack if it is shorted, or if the charge current is excessive.

Use only genuine fuse-protected* MULTIPLEX *batteries!

If a short-circuit occurs and you eliminate it (or cut off the charge current), the fuse cools down again in about one minute, and the battery is then ready for use again.

· Notes on charging techniques:

Standard (slow) charging is possible, and no special techniques are required. If you wish to **rapid-charge** the battery using automatic termination, the charge current must not exceed 600 mA, otherwise the fuse element may be triggered and the charge process will be interrupted prematurely.

5.2. Charging the receiver battery

Read the charging notes printed on the battery. Do not exceed the charge currents stated by the battery manufacturer!

5.3. Fitting the transmitter crystal

Transmitter crystals feature a blue sleeve, and the printed channel number is preceded by "Tx" or "S". The transmitter and receiver crystals must bear the same channel number. The transmitter crystal is plugged into the RF module (-> illustration on page **i**).

Please be very careful when handling crystals:

- ❖ Don't drop them
- ❖ Don't force them into the crystal socket
- ❖ Protect them from vibration in storage and in use

5.4. Adjusting the trigger

If you loosen the screw in the trigger, the bar can be adjusted to suit your "finger diameter".

CAUTION when tightening the screw: if you over-tighten it, the pressed-fit nut on the other side may come loose!

5.5. Testing the transmitter

Now you can switch on the transmitter, connect the components of a receiving system, and find out "what happens" when you operate the transmitter. All you need are a receiver with servos connected to channels 1 and 2 and a receiver battery. If you prefer to use a complete car for this, connect the steering servo to channel 1 and the throttle/brake servo to channel 2.

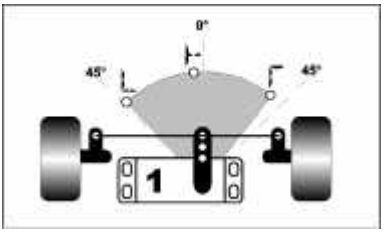
6. The STEERING

The PROFI CAR offers the following facilities for setting up the steering function:

- **Servo norm, centre and travel right/left (➔ 6.1)**
  These settings are used to adjust the servo to match your car's mechanical system, and at the same time determine the maximum steering travel and the centre setting for straight running.
- **Steering MINTRA (MINimum TRAvel) (➔ 6.2)**
  You can adjust the steering travel using the digi-adjustor while you are running the car. This enables you to fine-tune the steering response to suit changing course conditions or vehicle characteristics (e.g. tyre temperature). This menu point allows you to define the smallest steering travel which you can set by rotating the digi-adjustor. MINTRA avoids the danger of suddenly having no steering control if you turn the adjustor too far by mistake. The smallest value you can set is 30%.
- **EXPO (➔ 6.3**
  By applying EXPOnential to the steering function, you can make the steering response of your car more or less sensitive around the centre position.
- **Steering travel and trim increment (➔ 6.4)**
  („🔧" menu, menu point „TRIM")
  The effect of trim rocker A (steering centre point) and the digi-adjustor (steering travel) can be set to FINE (1% increments), MEDIUM (2% increments) or COARSE (4% increments). The selected setting also applies to all other trim rockers.

6.1. Adjusting the steering servo

The first step is to set the signal norm and the direction of rotation for the servo, followed by the settings for left (L), straight ahead (□) and right (Γ). These basic settings ensure that servo 1 (steering servo) is set up correctly to suit the characteristics of your model.



The drawing on the right shows an example of the settings available in the "S-TRA" menu. The stated angles (0°/45°) show what the servo "can do". The adjustments points „L" and „Γ" define the **maximum** travel set for the steering servo. To adjust either of these points you must turn the steering wheel in the corresponding direction. At the „□"point you determine the servo setting for "straight ahead".

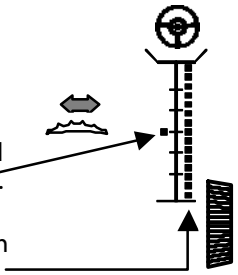
The "**S-NORM" menu point** is used to select the signal format (MULTIPLEX or UNIVERSAL) and direction of rotation for the servo. "MULTIPLEX norm" means that the pulse width for the centre position is 1.6 ms, and the full range is +/- 0.55 ms. UNIVERSAL servos operate on 1.5 ms +/- 0.5 ms. If the selected signal format does not match your servo, the centre position and travels will not be correct.

The "**S-TRAV" menu point** is used to set the centre position and steering travels for right and left.

This is the procedure:

PREPARATION:

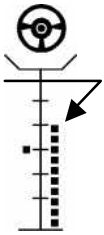
- Set the steering trim to centre
  Operate the ribbed steering trim rocker until only the centre point is visible on the screen.
- Set the steering travel to maximum
  Operate the digi-adjustor until the maximum steering travel is displayed on the screen.



press until S--NORM appears		S--NORM t MR
	Select norm and rotation using the digi-adjustor	UN UNIVERSAL normal UR UNIVERSAL reverse MN MULTIPLEX normal MR MULTIPLEX reverse
press until S--TRAV appears		S--TRAV t □-- 3 **%**
	Select right, centre and left by turning the steering wheel, then change using the digi-adjustor	r right 0 – 110 % □ centre +/- 50 % L left 0 – 110 %

6.2. Setting minimum steering travel

You can adjust the steering travel during a race using the digi-adjustor, ensuring that the response is optimum for the track and your car at all times.
Note: **this only works** when the operating screen is visible!



The vertical bar on the far right of the screen shows how much steering travel you actually have available at any one time. In our example 2/3 of the possible range between minimum and maximum is available.

It is important that you are able to set a **minimum** travel beyond which the digi-adjustor cannot reduce the steering; this can be set within the range 30% and 100%.

press until MIN-TR appears	Search for menu point	MIN-TR 60 %
	Set minimum travel	Range: 30% to 100% Default: 44%

TIP !
The **maximum steering travel** must be defined by adjusting the mechanical set-up for the steering servo (➔6.1).

6.3. EXPO

EXPO alters the steering characteristics of your model. If you set positive values (e.g.-50%), the steering travel will be reduced around centre, making your car easier to steer in a straight line at high speed.

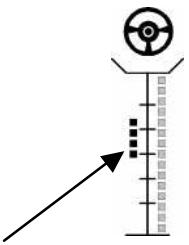
Negative EXPO values produce the opposite effect, making the steering response more direct around centre.

press until EXPO appears	Search for menu point	EXPO 70 %
	Set Expo	Range: -100% to 100% Increment: 5% Default: 0%

6.4. Setting the steering trim increment (menu „🔧“)

The trim rocker for steering can easily be found "blind" because its shape and ribbed surface are different from those of the other rockers.

The steering trim can be used to adjust the centre position of the steering servo by 28% in either direction. Each increment offsets the centre by at least 1% (FINE) and at most 4% (COARSE). You can select the size of the trim increment in the TRIM menu point of the „🔧“ menu; the default setting is MEDIUM (2%).



NOTE: the setting which you choose here also applies to the idle and brake trims, and the steering travel adjustment (digi-adjustor).

A vertical bar on the screen shows the current trim position.

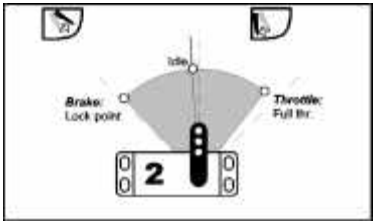
🔧, 🔧, ... until TRIM appears	Search for menu point	TRIM MEDIUM
	Select trim increment	COARSE 4 % MEDIUM 2 % FINE 1 %

7. The THROTTLE/BRAKE servo

The PROFI car offers the following functions for throttle/brake:

- ❖ Throttle and brake with separate EXPO
- ❖ Idle trim
- ❖ Lock point trim

For the sake of clarity:
The diagram on the right shows the servo positions which are assigned to the individual points on the throttle-brake curve.



Full throttle is influenced solely by the travel you set for the throttle/brake servo.

You can also adjust the **idle setting** while the car is running by operating the trim rocker (see above). The basic setting is defined using the CENTRE adjustment point for the throttle/brake servo.

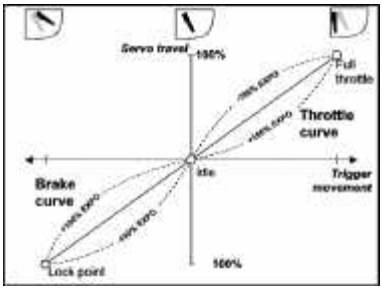
The lock point can also be changed when the car is running. The basic setting is defined by adjusting the travel of the throttle/brake servo.

7.1. Throttle and brake with EXPO

You can apply EXPOnential to set the response of the throttle/brake function to suit your personal preference.

The diagram on the right shows the relationship between the trigger movement and the servo travel in graphic form.

If you set EXPO to 0%, the effect of the throttle/-brake curve is linear. The dotted lines show how EXPO can alter the two curves.



If you set EXPO to a negative value, the trigger will be more sensitive around the idle position. Positive EXPO values produce an aggressive effect.

This is the procedure:

↻, ↻, ... EXPO THR	Search for menu point for EXPO THRottle	EXPO THR 35 %

or:

↻, ↻, ... EXPO BRK	Search for menu point for EXPO BRaKe	EXPO BRK 27 %

then:

	Set value	Range: -100% to 100% Default: 0% Increment: 5%

7.2. Signal norm, direction of rotation and travels for the throttle/brake servo

First set the signal norm and direction of rotation of the servo.

↻, ↻, ... S--NORM	Search for menu point for servo norm	S--NORM 2: MR
	Select norm and direction using the digi-adjustor	UN UNIVERSAL normal UR UNIVERSAL reverse MN MULTIPLEX normal MR MULTIPLEX reverse

The next step is to define the basic settings for full throttle (L), idle (□) and for the lock point (F). These settings ensure that servo 2 (throttle/brake servo) is set up correctly to suit your model.

press until 5--TRAV appears		5--TRAV 2: □-- 3 %	
	Select the desired point with the trigger, then set using the digi-adjustor	F Lock point □ Idle L Full throttle	0 – 110 % +/- 50 % 0 – 110 %

7.3. Idle trim

The idle trim can be used to compensate for changes in the running characteristics of any car with an internal-combustion motor, e.g. changes due to fluctuations in motor temperature.

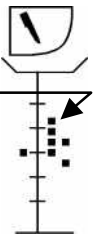
Idle trim allows you to adjust the idle by 28% in either direction. Each increment offsets the idle point by at least 1% (fine) and at most 4% (coarse). You can select the size of the trim increment in the "TRIM" menu point of the „🔧" (➔6.4, page10). The default setting is MEDIUM (2%).

A vertical bar on the screen shows the current trim setting. In the example on the right the idle has been offset in the direction of "reduced throttle" by about half the full trim range.

7.4. Trimming the brake lock point

The lock point of the brake tends to vary in the course of a race, so we have provided a trim rocker which can be used to compensate for these variations. The rocker affects the lock point of the THROTTLE/BRAKE servo (servo 2).

The brake trim allows you to adjust the lock point by 28% in either direction. Each increment offsets the idle by at least 1% (fine) and at most 4% (coarse). You can select the size of the trim increment in the "TRIM" menu point of the „🔧" menu (➔ 6.4, page 10). The default setting is MEDIUM (2%).



A vertical bar on the screen shows the current trim setting. In the example on the right the lock point of the throttle/brake servo has been offset in the direction of "greater brake effect" by slightly less than half the full trim range.

8. Stopwatch and operating hours timer

The PROFI CAR 301 provides the following timing facilities:

- **Stopwatch (TIMER)**
  Start and stop the stopwatch using the handle button, provided that the function has already been switched on in the TIMER menu.
- **Stopwatch SIGNAL**
  Audible signal which can be used to signal the end of a practice run, for example (max. 20 min.).
- **Operating hours timer (OPTIME)**
  This timer records the period of use of the transmitter battery, and it always runs when the transmitter is switched on. You can erase the operating time in the „“OPTIME menu.

8.1. Activating the stopwatch (timer)

This is the procedure:

- Search for the menu point TIMER with the button
- Select ON or OFF with the digi-adjustor

Press any menu button (except) to return to the operating screen.

The stopwatch is operated by the handle button (START/STOP).

Resetting the stopwatch to 0:
The stopwatch is reset to 00.0 by holding the handle button pressed in for longer than 3 sec. You can only do this when the operating screen is displayed.

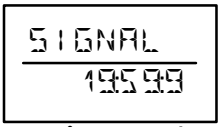
8.2. Stopwatch signal (race duration)

The stopwatch's signal function is useful for practice purposes: you set the signal time to the planned race duration (max. 20 min.). Once you start the stopwatch (by pressing the handle button) you will hear the following signals:

short tone	every full minute, every 10 sec. during the last minute every second during the last 10 sec.
long tone	when the set time is elapsed

This is the procedure for setting the signal time:

- Search for the menu point SIGNAL with the button
- Rotate the digi-adjustor to adjust the flashing number
- Press the handle button to move the cursor to the next character

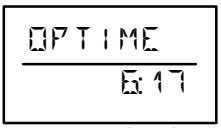


min : sec : 1/10

Press any menu button (except) to return to the operating screen.

8.3. Checking and erasing the operating time

In this menu point you can check and erase the recorded operating time. To erase the value you must hold the handle button pressed in for longer than 3 sec; you will hear an audible signal to confirm that the erasure has taken place.



h:min

- Use the button to search for the menu point OPTIME
  The screen shows hours and minutes.

Press any menu button (except) to return to the operating screen.

9. Model memories

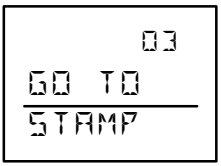
The model memories store all the settings which you have entered for a particular vehicle. The settings include:

- Modulation (FM/AM)
- Servo signal format, direction of rotation, centre, travels
- Settings for throttle, brake and steering
- Timer setting (ON or OFF) and signal setting
- Trims

If you switch off the transmitter, or switch to a different model memory, the data in the active model memory is updated.

9.1. Switching to a different model memory

- Use the button to search for the menu point GO TO
- Use the digi-adjustor to select the destination memory
  The screen shows name, memory and trim settings.
- Complete the change by holding the handle button pressed in for longer than 3 sec.



A long audible tone confirms that the change has been made, and the operating screen appears again.

9.2. Entering the model name

A model name can consist of up to six letters, numbers or other characters. The following characters are available:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z - . 0 1 2 3 4 5 6 7 8 9

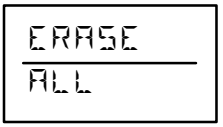
- Use the button to search for the menu point MODEL
- The first character flashes, and can be changed using the digi-adjustor.
- Press the handle button to shift to the next character, and from the last character back to the first one

Press any menu button (except) to return to the operating screen.

9.3. to return to the operating screen

This menu point is used to reset the model memory to the factory default settings. These settings are:

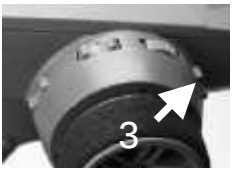
Servo centre 0%, servo travels 100%



- Use the 🗁 button to search for the menu point ERASE ALL
- Confirm the erasure by holding the ◔ button pressed in for longer than 3 sec.

Press any menu button (except 🗁) to return to the operating screen.

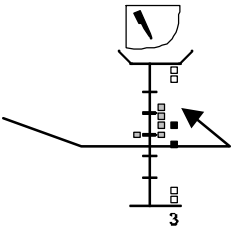
10. Auxiliary function, servo 3



One special feature of the PROFI CAR 301 is that it can control a third servo to provide an auxiliary function, e.g. for mixture adjustment, two-speed gearbox etc. The auxiliary channel is controlled by trim rocker 3.

Three different modes are available for auxiliary channel 3.

- ❖ 3P 3 positions (left, centre, right)
- ❖ FL flashing
- ❖ PR proportional (25 increments)



The screen shows the position of the auxiliary channel. The default setting for the auxiliary channel is three-position mode.

You can adjust travel and centre for servo 3 in the menu point "S-TRAV" in the "🔧" menu (➔ 10.2).

This is how auxiliary channel 3 is used in its three modes:

- **"3P" mode (3 Positions)**
  If you press the same end of rocker 3 repeatedly, the servo switches between centre and one end-point. If you press the other end of rocker 3, the servo immediately moves to the opposite end-point.
- **"FL" mode (FLashing)**
  In flashing mode the servo switches automatically between centre and one of the two end-points every 0.5 sec. The flashing is switched on and off by pushing rocker 3.
- **"PR" mode (PRoportional)**
  Every time you press rocker 3, the servo position changes by one increment. 25 increments are available.

In practice, the best way to find out how these modes of operation work is simply to try them out using a spare servo.

10.1. Setting the auxiliary channel mode (menu point "S-NORM")

The modes for the auxiliary channel are located at the point where you also set the direction of rotation and signal format for this channel.

- Use the „🔧" button to search for the menu point "S-NORM".
- Select one of the modes: **3P**osition, **FL**ashing or **Pr**oportional using the digi-adjustor.

Press any menu button (except 🔧) to return to the operating screen.

10.2. Adjusting auxiliary channel travel and centre (menu point "S-TRAV")

The steering wheel is used to select the servo position of the auxiliary channel which you wish to adjust.

- Use the „🔧" button to search for the menu point "S-TRAV".
- Select left (⌊), centre (□) or right (⌐) with the **steering wheel**
- Adjust the selected point using the digi-adjustor

Press any menu button (except 🔧) to return to the operating screen.

11. The "toolbox" 🔧

The "toolbox" is opened by pressing the 🔧 button. It contains the following facilities:

❖ **Settings which affect the whole transmitter**

If you select one of these settings, the screen shows the symbol „- - -" instead of the memory number. This is intended to remind you that the selected settings apply to the whole transmitter, i.e. they are not specific to a particular model memory. These settings in detail are: owner's name, screen language and battery alarm threshold

The following parameters can also be set, but they apply to each model memory individually:

❖ **Modulation (AM or FM)**

❖ **Basic servo settings ("S-NORM" and "S-TRAV")**

❖ **Trim increment size**

In this Section you will find all those settings which have not been covered in the instructions so far.

11.1. AM-FM switching (menu „🔧", AM--FM)

The PROFI CAR transmitter is the world's first to allow you to use AM (Amplitude Modulation) and FM (Frequency Modulation) receivers without having to swap RF modules. In the AM-FM menu point you can define which type of modulation is to be used for each model memory separately.

- Use the „🔧“ button to search for the menu point “AM-FM”.
- Use the digi-adjustor to select the correct modulation to match the receiver in that model.

Press any menu button (except 🔧) to return to the operating screen.

11.2. Entering the owner's name (menu „🔧“, NAME)

To identify your transmitter you can enter a 6-character name which appears briefly on the screen when you switch the unit on. The following characters are available:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z - - 0 1 2 3 4 5 6 7 8 9

- Use the „🔧“ button to search for the menu point „NAME“.
- The first character flashes, and can be changed using the digi-adjustor.
- Use the handle button ◐ to shift to the next character, and from the last character back to the first one.

Press any menu button (except 🔧) to return to the operating screen.

11.3. Selecting the screen language (menu „🔧“, TEXT)

You can select any of five languages for the screen displays:
German, English, French, Italian, Spanish

- Use the 🔧 button to search for the menu point „TEXT“.
- Select the language using the digi-adjustor.

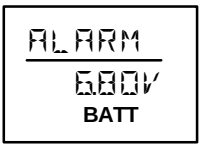
Press any menu button (except 🔧) to return to the operating screen.

11.4. Setting the battery alarm threshold (menu „🔧“, ALARM)

The battery alarm threshold can be adjusted within the range 6.80 V to 7.20 V in 0.05 V increments. The default setting for the alarm threshold is 7.00 V.

The higher the threshold you set, the more reserve energy is left between the alarm being triggered, and the battery being finally exhausted.

This is the procedure:



- Use the 🔧 button to search for the menu point „ALARM“.
- Use the digi-adjustor to alter the alarm threshold in 0.05 V increments between 6.80 V and 7.20 V.

Press any menu button (except 🔧) to return to the operating screen.

12. Tips on installing the receiving system in the model

There is usually very little scope for changing the arrangement of the receiving system in a model car. However, please read and observe our recommendations regarding deploying the aerial.

The following points are particularly important:

- Keep the receiver as far away as possible from:
  - electric motors
  - electrical ignition systems
  - servos
  - batteries
  - cables (especially those carrying high currents)
- **Run the aerial vertically up and out of the model in as straight a line as possible and by the shortest route.**
- Do not shorten the aerial!
- Do not wind or coil up the aerial and stow it inside the model.
- Do not deploy the aerial inside model parts or attached to model parts which are reinforced with carbon fibre (shielding).
- Protect the receiver from vibration
  (wrap it in foam and stow it loosely in the model).

TIP ! if you model is powered by an electric motor:
Keep the receiving system as far as possible from the power system, as the high currents in the power system can generate interference. Ensure that electric drive motors are correctly suppressed.

Carry out a particularly thorough range check before the first run (➔.13.2).

13. Notes on using the system

13.1. Post Office regulations for the U.K.

The frequency bands available for radio controlled **Surface models** are **40.665 to 40.955 MHz (Channels 50 - 79 incl.)**.

Please pay attention to the attachment "Directive R&TTE 1999/5/EC".

As of 1 January 1981 model control equipment was exempted from the licensing requirements of the Wireless Telegraphy Act 1949. This simply means that no licence is required to operate RC equipment in the U.K. If you need further information please contact:

The Low Power Radio Section, Radiocommunications Agency
Room 712, Waterloo Bridge House, Waterloo Road, London SE1 8UA

13.2. Range checking

The range check makes a really important contribution to the operational security and safety of your model. We have developed a test procedure based on our own experience and measurements, which will always keep you on the safe side.

- Collapse the transmitter aerial completely, and hold the transmitter as if operating a model.
- The check must be carried out with the motor running.
  Ask a friend to hold the model, or pack it up so that the steering and driven wheels are free to move.
- There must be no large metal objects (cars, wire fences, etc.) in the vicinity.
- There is no point in carrying out the check if there are other transmitters switched on - even on other channels.
- Switch on the transmitter and receiver, and check that the model responds correctly and immediately to all control commands, without carrying out any uncontrolled movements, when the transmitter is about 30 m from the model.

TIP !

Poor effective range may be due to any of the following problems:

- ❖ Inadequate suppression of electric power systems and ignition systems.
- ❖ Aerial wire damaged, too short (less than 40 cm) or poorly installed.
- ❖ Environmental effects (damp ground, shielding by metal fences, etc.).

If radio range with the aerial collapsed is not sufficient, and you are unable to identify any of the potential problems stated above, repeat the check with the aerial extended. The safe operating distance between transmitter and model should now be around 1.5 times the actual required radius of action.

If you have any doubts, don't run your model! Check everything again in peace and quiet, so that you can locate and eliminate the problem reliably!

13.3. Care of the transmitter

Protect your transmitter from mechanical damage, temperatures above 60°C (direct sunshine in a car), damp, solvents, fuel, exhaust residues and dust. Bear in mind that condensation may occur inside the transmitter if it is subjected to a swift change of temperature (e.g. when taken from a warm workshop to a cold car). Condensation may prevent the transmitter working properly or at all. If this should happen, allow the transmitter plenty of time to adjust to the new temperature, and be sure to carry out a particularly thorough range test. Check that the transmitter is completely dry, including the interior (battery compartment), before you switch it on.

Cleaning the transmitter

The best method of removing dust is to use a soft paintbrush. The case can be cleaned with a slightly damp cloth and a mild household cleaning agent.

Take great care that no liquids get inside the transmitter.

13.4. Maintenance

Your transmitter contains no parts which require maintenance.

However, we do recommend that you carry out regular range checks, and check that all functions are working correctly.

What to do if you have queries, or if problems arise?

First ask your local model shop for advice.

The last page includes a list of our Service Centres.

For technical queries, or questions regarding the use of our transmitters, you can ring the **MULTIPLEX-Hotline** +49-7233-7343. You can also reach us by e-mail under TECHNIK@multiplex-rc.de

14. PROFI CAR 301 menu structure

This is the menu structure of the PROFI CAR 301:

S--NORM *Direction of rot. + signal format for thr./brake servo*	S--NORM *Direction of rot. + signal format for steering servo*	TIMER *Stopwatch ON and OFF*	TRIM *Trim increments, COARSE, MEDIUM or FINE*	GO TO *Switch to a different model memory*
S--TRAV *Centre and travels for throttle/brake*	S--TRAV *Centre and travels for steering*	SIGNAL *Set signal time*	TEXT *Screen text language*	MODEL *Enter model name*
EXPO THR *EXPO for throttle*	EXPO *EXPO for steering*	OPTIME *Check/erase oper. hours timer*	NAME *Transmitter owner's name*	ERASE ALL *Erase model memory*
EXPO BRK *EXPO for brake*	MIN--TR *Minimum steering travel*		ALARM *Alarm threshold for battery alarm*	
			S--TRAV *Centre and travels for servo 3*	
			S--NORM *Operating mode for servo 3*	
			AM--FM *Change modulation*	