MULTIPLEX ®

ROYAL

A traditional MULTIPLEX name with a reputation for innovation in transmitter design

Thirty years ago we made radio control history with the MULTIPLEX Royal. The transmitter's design, control method and technology showed the way forward, and later Royal series also represented important milestones.

*Amongst other innovations, the Royal name is linked with the introduction of **F**requency **M**odulation and **M**icro **C**omputer technology into the transmitters used by modellers.*

ROYAL

A traditional MULTIPLEX combination of hand-held and tray-mounted transmitter!

The very first Royal transmitters exploited a layout which was equally suitable for use hand-held and in a transmitter tray. Since then this layout has been emulated by many other transmitters - and not only MULTIPLEX types.

ROYAL

Innovatory ideas combined with elegant design

The basic design principle of "form follows function" has always been the foundation of the Royal philosophy. Time and again we have managed to pack new, exciting functions into the elegant case of the Royal transmitter.

ROYAL

The contemporary development of successful design concepts:

evolution

ROYALevo

The building blocks of a new design concept

+ **Crystal or synthesizer and scanner modes, depending on model**

+ **Hand-held or tray-mounted - in one unit**

+ **Precision ballraced stick units in swivelling mounts**

+ **Ergonomically moulded stick-tops**

+ **Direct menu control system**

+ **Tilting aerial, fully retractable**

+ **Dual digi-adjustors**

+ **Large folding graphics screen**

+ **Cruciform digital trim assembly**

More facts:

• **9 or 12 channels**

• **4 flight modes per memory**

• **12 /20 model memories**

• **3 timers**

• **14 mixers (11 free mixers)**

• **Freely selectable transmitter modes**

• **Quick setup using "Types"**

• **Selective Trainer mode, Teacher or Pupil transmitter**

• **Comprehensive software for fixed-wing and helicopters**

• **PC connectivity, upgradeable**

ROYAL
evo

DIGITAL - RC - SYSTEM - MADE IN GERMANY

MULTIPLEX

Here at MULTIPLEX we can look back on an abundance of experience in developing software for radio control systems.

In this work there are always two factors which are hard to reconcile:

many facilities ⇔ ease of operation.

In both areas we have set new standards in the world of RC systems:

on the one hand with the PROFI 4000,

the completely open system which offers virtually infinite facilities, but which does require the operator to become properly familiar with the system's complexity if all the features are to be exploited.

On the other hand with the COCKPIT$_{MM}$,

many modellers use this unit for relatively complex applications without ever reading the instructions in depth.

The ROYAL evo is a radio control system which fulfils the two requirements in a form which we believe to represent the optimum.

In terms of facilities the ROYAL evo moves into areas which have previously been the preserve of the PROFI 4000.

A 12-channel system for fixed-wing and helicopter applications which also includes synthesizer and scanner functions is a complex device, and must feature high-level operating convenience if the user is to learn his way around the system quickly and safely.

We have made full use of our past experience and created a simple method of operation with the following features:

• the PROFI mc 3030's clearly structured menu system in plain English,

• the Commander series' Quick-Select process,

• the COCKPIT$_{MM}$'s 3-D digi-adjustor,

and

• the PROFI CAR's Direct Menu buttons.

The result is a transmitter which provides such obvious methods of accessing even complex setup processes that, after a very short time, you will only need to refer to the manual now and then for the occasional special function.

Control elements
positioned symmetrically and within easy reach at the corners of the case
• 3-D digi-adjustor
• momentary switches
• up/down switches
• 3 switches
all these are freely assignable: they can be used as function switches, adjustors or direct transmitter controls.

Stick units
• precision ballraced stick units
• selectable ratchet / self-neutralising action
• swivel mounts; can be rotated through 15°
  This allows the thumbs to follow their natural rotational arc when the transmitter is used hand-held.

QS Quick Select - the "easy choice" method
When you are assigning transmitter controls and switches, all you have to do is move the desired control, and the transmitter assigns the channel.

Quick-Select is also useful when setting up mixers. If the setup menu is open, a brief movement of the transmitter control activates the value you wish to change.

Digital cruciform trim assembly
• On-screen display of digital trim positions
• Ergonomically efficient

(both axes can be adjusted from the same, easily reached group of buttons)

In-flight display

Digi-adjustor function
  2 values can be adjusted in flight!

Model name
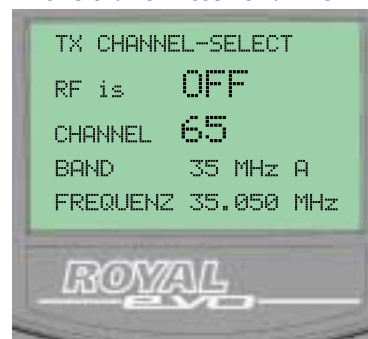
State of charge and transmission mode

Timer functions

Trim positions

Scan mode display
The arrow buttons are used to shift the frequency band range

SCANN 35 MHz-Band
Selected: K 65
Channel is FREE

《 60.61.62.63.64.65.66.67.68.69 》

Display for selecting the transmitter channel

TX CHANNEL-SELECT
RF is   OFF
CHANNEL 65
BAND   35 MHz A
FREQUENZ 35.050 MHz

Aerial
- Can be retracted into case
- Locks in two positions
  (straight or approx. 45/70º left/up).

Slider
Used as transmitter control or adjustor

Screen
- large graphic display, 8448 dots
- high-contrast,
- UV-stable, anti-reflective
- variable inclination (approx. 20°)
  always the perfect viewing angle, hand-held or in a tray

On/Off switch with RF indicator

Button pad
- 11 Direct Menu Select buttons
  (fast selection method for complex applications)
- Double function, provides swift alpha-numeric input,
- Linked to Quick Select function
- Alternative method of adjustment using digi-adjustor

Direct Menu Buttons for

ABC1	DEF2	GHI3	JKL4	MNO5	PQR6

When these buttons are pressed once, the screen shows:

⇩	⇩	⇩	⇩	⇩	⇩
SETUP Transmitter Servos Mixerdef. Teacher/Pup. User	**CONTROLS** Aileron Elevator Rudder …. ….	**MIXHER** Combi-Switch Aileron-Diff V-tail …. ….	**SERVOS** Adjustment Monitor Testrun	**TIMER** Reset Alarm	**MEMORIES** Modelselect Flightphases Admin Properties New model

Use Select Buttons to branch quickly into other menus

STU7	VWX8	ENTER	YZ_9	/-#0
⟨ ◎ ⟩	REV/CLR		▲	▼
Digi-adjustor on/off	Reverse/Erase	Confirm	Select up/down	+/− >/<

9

Features in detail   evo9   evo12

RF
	evo9	evo12
• Transmission mode	FM PPM	
• HFM-4 RF module	⊙	
• Channel-Check module	○	
alternatively:		
• synthesizer	⊙	
• scanner with channel-check function	○	

Servos
	evo9	evo12
• Maximum servo channels	9	12
• Signal format, MPX or UNIversal		
• Curves with 2, 3 or 5 points		

General mixers
	evo9	evo12
• pre-defined	3	3
• free	11	11
• maximum number of mixer inputs	5	5

... for fixed-wing models
• combi-switch
• differential, with suppression
• V-tail with rudder differential
• 4 flight modes

... for helicopters
• collective pitch to throttle, with 5-point curve
• roll-axis (aileron), pitch-axis (elevator) and yaw-axis (rudder) to throttle
• mechanically mixed rotor head types, 90° or 120°
• tail rotor
• gyro suppression with yaw (rudder) command
• virtual swashplate rotation (phase)
• 4 flight modes

... for safety
• battery alarm, variable threshold
• power-on alarm if MOT OFF is active, or throttle is not at idle position
• menu lock, code-protected user name

Model memories
	evo9	evo12
• number	12	20
• pre-defined model types	2	4
• alpha-numeric memory name, max. 8 characters		
• data transfer to / from PC		

Multi-function socket
• charge/discharge at max. 2 A
• socket for diagnosis lead and flight simulators
• Trainer mode socket
• PC interface socket
• data transfer transmitter / transmitter

Trainer mode
• can be used as Teacher or Pupil transmitter
• pupil can control up to four functions
• individual pupil functions selectable

Software (brief summary only!)
• Dual Rates, Expo and Slow for transmitter controls
• freely assignable transmitter controls, switches and servos
• 4 flight modes with "soft" transition

⊙ = standard / optional depending on set
○ = can be retro-fitted

Accessoires

Stick-tops (pair)
• 3 sizes (included in set)
• infinitely variable length
• ergonomically shaped

short   **medium**   **long**
 # 7 5300   **# 7 5301**   **# 7 5302**

Stick-top with switch
 # 7 5303
with integral push-button and rocker.
One can be fitted to transmitter.
No soldering required to install.

ROYAL evo transmitter tray
 # 8 5305
This transmitter tray converts the Royal transmitter into a convenient tray-mounted unit which is just as efficient in operation as the hand-held version. Even the switches on the case side are as easily accessible as normal, and can be operated without stretching.

ROYAL evo manual
For the first time we will supply the manual in two parts:
A) *a short-form manual for general use, containing all the most important settings (in 5 languages)*   **# 85 5320** and
B) *a CD which describes the facilities in great detail, in some cases backed up a with short video sequence. In 5 languages*   **# 85 5321**
Upon request we can also supply B/W print-outs of excerpts of this CD (excl. video sequences) for a modest fee (0.10 EURO/page). Please state language when ordering.

Specification
ROYAL evo 9 resp. 12
Functions:	9 resp. 12, all equal-value
Transmission mode:	FM PPM, 10 kHz spacing
Pulse widths:	MPX 1,6 +/– 0,55 ms
	UNI 1,5 +/– 0,5 ms
Power supply:	6 cells Mignon/AA
Current drain:	approx. 220 mA
Weight:	approx. 900 g (with battery)
Dimensions:	200 x 220 x 60 mm

ROYAL evo

ROYAL evo9 - Transmitter (not shown) # 4 5300
ROYAL evo 9-channel transmitter, with 6/1500 mAh NiMH battery. Please order RF module and crystals separately
HFM-4 RF module for use with crystals
35 MHz **# 4 5690** - 40/41 MHz **# 4 5691** - 72 MHz **# 4 5692**
S-HF synthesizer module
35 MHz **# 4 5693** - 40/41 MHz **# 4 5694** - 72 MHz **# 4 5695**

ROYAL evo9 - Vario-Sets
Contents
ROYAL evo 9-channel transm., w. 6/1500 mAh NiMH battery
with HFM-4 module, Mini DS IPD receiver
35 MHz **# 3 5300** - 40/41 MHz **# 3 5301** - 72 MHz **# 3 5302**
(please order crystals separately)
with synthesizer RF module and RX-Synth 9 receiver
35 MHz **# 3 5303** - 40/41 MHz **# 3 5304** - 72 MHz **# 3 5305**

ROYAL evo9 - International-Sets
Contents
1 ROYAL evo 9-ch. transm., w. 6/1500 mAh NiMH battery
4 Royal-BB-Servos
1 receiver battery, 4/1700 NiCD
1 switch harness with charge socket
1 plug-type charger
with HFM-4 module, Mini DS IPD receiver and pair of cryst.
35 MHz **# 3 5310** - 40/41 MHz **# 3 5311** - 72 MHz **# 3 5312**
with synthesizer RF module and RX-Synth 9 receiver
35 MHz **# 3 5313** - 40/41 MHz **# 3 5314** - 72 MHz **# 3 5315**

ROYAL evo12 - Transmitter (not shown) # 4 5320
ROYAL evo 12-channel transmitter, with 6/1500 mAh NiMH battery. Please order RF module and crystals separately
HFM-4 RF module for use with crystals
35 MHz **# 4 5690** - 40/41 MHz **# 4 5691** - 72 MHz **# 4 5692**
S-HF synthesizer module
35 MHz **# 4 5693** - 40/41 MHz **# 4 5694** - 72 MHz **# 4 5695**

ROYAL evo12 - Vario-Sets
Contents
ROYAL evo 12-ch. transm., w. 6/1500 mAh NiMH battery
with synthesizer RF module and RX-Synth 12 receiver
35 MHz **# 3 5323** - 40/41 MHz **# 3 5324** - 72 MHz **# 3 5325**

ROYAL evo12 - International-Sets
Contents
1 ROYAL evo 12-ch. transm., w. 6/1500 mAh NiMH battery
4 Royal-BB-Servos
1 receiver battery, 4/1700 NiCd
1 switch harness with charge socket
1 Stecker-Ladegerät
with synthesizer RF module and RX-Synth 12 receiver
35 MHz **# 3 5333** - 40/41 MHz **# 3 5334** - 72 MHz **# 3 5335**
w. synthesizer module, scanner and RX-Synth 12 receiver
35 MHz **# 3 5336** - 40/41 MHz **# 3 5337** -

*** 41 and 72 MHz for export only - 72 MHz without option Channel-Check resp. scanner*

Synthesizer - the keyword

As with the transmitter, if the receiver includes a synthesizer there is no need for a plug-in crystal. The advantage of the synthesizer is that it can generate any frequency you wish to use within a certain band, i.e. all the channels on one band are available to you without the need to purchase extra crystals.

We have designed our synthesizer receivers in such a way that it is completely impossible to set the wrong channel accidentally.

Selecting the channel with a synthesizer receiver

• Setting up is simple and convenient, even if the receiver is not accessible.

• There is no chance of setting an incorrect channel.

• Channels can only be switched deliberately by the user: no automatic system.

• The receiver channel can be selected regardless of transmitter type.

• No servo signal is generated during the channel select process; the selected channel is checked and only then released for use.

Programming mode using push-button and any transmitter

The channel is selected using a button on the receiver, or a button on a parallel programming lead connected to the receiver. To determine the channel the transmitter is switched on with the aerial fully extended. The minimum distance to the nearest transmitter is 10 m. The receiver scans the band and detects "its" transmitter. You can then operate the transmitter controls to check that the receiver is responding correctly. Only if this is successful can the receiver be operated.

If the receiver is installed in the model and is inaccessible, the setup process can be carried out using a setup lead which is available as an accessory. A separate socket is provided for the setup lead, i.e. all other sockets remain available.

... with Synthesizer

The synthesizer receiver for the demanding modeller. The 9-channel receiver is a compact unit, and has sufficient channels for most applications even in sophisticated models.

The 9th channel is accessible via a Y-lead, to which the receiver battery is also connected.

The 12-channel dual-conversion receiver provides 12 directly accessed servo channels, and can also be used with two directly connected batteries controlled by an integral battery switch. Both receivers are processor-controlled and exploit the IPD process. The channel is selected using a push-button and monitor LED, as described in the first column.

RX-9-SYNTH DS IPD receiver		RX-12-SYNTH DS IPD receiver	
35 MHz (A+B)	**# 5 5890**	35 MHz (A+B)	**# 55893**
40/41 MHz	**# 5 5891****	40/41 MHz	**# 55894****
72 MHz	**# 5 5892****	72 MHz	**# 55895****

Specification

No. of channels	9 resp. 12
Connector system	UNI
Reception system	Dual-conversion FM PPM
Sensitivity	2 µV
Power supply	4-6 NiCd/NiMH[1] cells
Current drain, no servos	< 15 mA
Dimensions	47 x 42 x 21 mm
Weight	~ 44 g

[1] RX Synth 12 features an integral battery switch for two identical 5-cell receiver batteries

Setup lead with button and LED (not shown) **# 8 5048**