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TX 2 TX 3

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DOWNLOAD THE SITE UNDER WORD-FORMAT (<500 kB)

3. The connections for transmitters fitted with buddy box

The person that send me an E-mail on the 25th of september 2008 with a solution for connecting a Graupner to an EVO-12, please contact me again; your E-mail was accidently deleted by my anti-spam filter

Read the previous chapters before starting this one !!!

Futaba : 4 types of buddy boxes, one with DIN connector 6 contacts (fig. 3-01), 2 others with a mono jack connector of 3.5 mm or 2.5 mm (fig. 3-02) and a last one with a square connector (fig. 3-03). The buddy box is not standard on certain types of transmitters and costs +/- 25 Euro, the lead with DIN connectors +/- 35 Euro, the lead with jack connectors +/- 7 Euro.

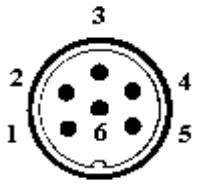


Fig. 3-01 6pin

Contact pin configuration viewed on female plug mating face :
1 = +V batteries (SWITCHED)
Shield = GROUND
2 = OUT
3 = IN
4 = +V (for some transmitters only).
Connecting pin 4 and 5 to each other on some transmitters will stop the HF-transmission and thus the transmiiter will not send out any signal (this is the case for 9ZAP/9ZHP, probably also for the FF8/8UAP and FF7/7UAP, NOT for the Robbe/Futaba F16-FC16-FC18, for the FC28 I don't know)
6 = +5v on certain transmitters only (9ZAP/9ZHP, probably FF8/8UAP and FF7/7UAP) and is used by DSC-cable.

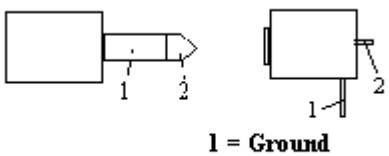


Fig. 3-02

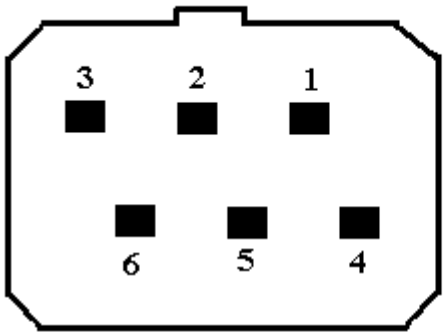
Fig. 3-02 : Jack, mono, 3.5 mm, male and female

(for the Futaba FX14 & FX18 : jack **2.5** mm)

Futaba FX 14 & FX 18 : the buddy box is standard from factory, but the jack is of diameter 2.5 mm instead of 3.5 mm.

Futaba has a lead with on one side a jack 2.5mm, and on the other side a jack 3.5mm. All this to make flying instruction more complicate between the same brand of radios! Or is this called new technology? Anyway, for the handyman that you are, there will be no problem to make a lead yourself.

Futaba FF9/9C : this radio is fitted with a **SQUARE-TYPE** of buddy box connector !!!
And of course not to be found in the normal electronic shop, being a Futaba-standard!!! Isn't this a nice way to promote RC-flying to newbies?? Bah!??
Since then, those connectors are available here : www.customelectronics.co.uk
Hereunder the pin-lay-out in fig.3-03 received from David Armstrong and personally checked. He wrote me : "I used some pcb header pins and glued two rows of 3 pins , and some heat shrink sleeving around the outer, seems to work ok at the moment. There is no facility to switch off the pupils transmitter (or at least I have not figured it out), so removal of the crystal or module from slave-transmitter is required."
Another correspondent A.Pinchon confirmed that bridging connection 4 and 5 with the transmitter OFF, the transmitter is switching on but the HF-part is not working (thus no transmission, used e.o. for DSC).
I bought a buddy lead with square connector to DIN-connector (ref. 1592) and paid 29 Euro... Futaba knows why...



1 nc
2 ground
3 signal OUT
4 +V
5 +V Switched
6 signal IN

pin-layout renumbered on May 25th 2003 according to manufacturer's numbering

Futaba FF9/9C
buddy box connector
fiche écolage

view on female plug mating face
vue du coté d'accouplement de la fiche femelle

Fig. 3-03

Hitec : A correspondent from New Zealand, Alan Tong confirms this :

"All Hitec buddy box sockets are from the same type as Futaba DIN-socket with 6 contacts. The Hitec and Futaba radios are fully compatible except that Hitec recommend the use of their

trainer cord #5810 which has one end labelled "Master" and the other "Slave". The slave end has pin 4 and 5 shorted out (pin 4 and 5 connected to each other)."

ATTENTION 1 : ***There is still a difference between Hitec and Futaba : Hitec has pin 6 connected to the ground (as well inside the transmitter as in the cord) ,but on some Futaba radios pin 6 gives +5Volt (for DSC). Above that, on some Hitec TX, pin 4 is also connected to Ground (contrary to Futaba, where it is +V !!!). There have been cases where a small electronic component (probably a self of 10µH) fried inside the Futaba radio, but without any known consequences. It's about the FF8/8UAP. A friend of mine fried his Futaba 9Zap when connecting to a Hitec Flash. The problem is caused by the difference in assignment of pin 6 and 4 between Futaba and Hitec.***

ATTENTION 2 : ***Problems can also arise when 2 Hitec transmitters are connected with a Futaba buddy cord, where smoke comes out of one of the radios. This happens with some more recent Hitec radios, but not any problem exists when using a Hitec trainer cord.***
Here the problem cases when a Futaba trainer cord is used : Eclipse<-->Prism, Eclipse<-->Flash, Eclipse<-->Focus, Laser<-->Prism, Laser<-->Flash, Laser<-->Focus

Note from Hitec found on their site
http://www.hitecrcd.com/Radios/RadioHome.htm
Important Information Regarding Trainer cord compatibility
To our valued customers,
While Hitec radios are known to be trainer compatible with other Hitec and Futaba systems, Hitec has determined that the two-way Futaba cord is not 100% compatible with our systems and strongly suggests it not be used at any time. Our tests show that when the Futaba trainer cord is used with a Hitec radio the slave transmitter will emit an RF signal, thus creating a potentially dangerous interference situation, and in some cases will burn up components in the slave and or master radio. Hitec suggests that only the one-way Hitec trainer cord (#58310) be used with Hitec radio systems for training. Failing to do so will void the customers warranty and could create a potentially dangerous situation. Hitec apologizes for any inconvenience this may cause, but the safety of our customers is our utmost concern.

My conclusion for the Hitec-story : to connect 2 Hitec to each other or Futaba to Hitec, make yourself a trainer cord **only and exactly** as described in fig. 7f-03 of chapitre 7, it's the simpliest and the only solution without any risk. You will then have to remove the crystal from the slave transmitter. If one of the connectors is not a DIN 240°, then always the same principle : only connect ground and signal (OUT or IN)

Multiplex : fig. 3-04

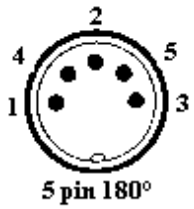


Fig. 3-04

Contact pin configuration viewed on female plug mating face :
3 = Ground
4 = OUT / IN
1 = +V batteries
2 = + V batteries (SWITCHED)
5 = not used (see hereunder)

The new models of Multiplex radios have 3 more contacts that are used to copy data to another radio or to a PC or for direct connection to the receiver for adjustments without HF.

The new Multiplex Royal Evo is thrown into the market. On this radio, there is a possibility within the programming to define what brand of radio is used as pupil-radio. This manufacturer finally understood.

For linking 2 Multiplex radios for teaching, there are 2 possibilities :

A) buddy box between 2 older types of radios (e.o. Europa Sport, Europa Sprint, Europa MC, Combi 80, Royal 5+2):

pupil-TX to master-TX :
contact 3 to 3
contact 2 to 1

B) buddy box with one new type of radio as master :

Here you'll find the drawing of the original buddy lead of Multiplex (fig 3-05) :

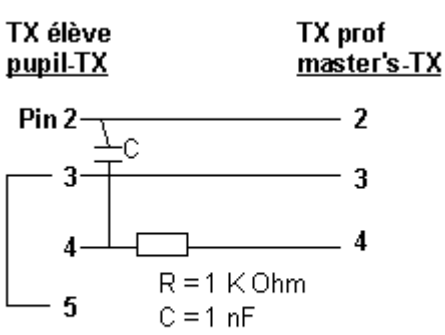


Fig. 3-05

Notes : The bridge between contact 3 and 5 makes the HF-part inoperative for all Multiplex radios.

If you don't want the pupil-TX being powered by the battery of the master-TX, do not connect contact 2 to 2.

The original lead is not shielded, but at every end a ferrite core is fitted with the lead being 5 times wrapped around.

If you use a shielded lead, I suppose that ferrites are not necessary.

About the capacitor and the resistor (and the ferrites), I found a website were they where all omitted...

Originally the Pico Line and Cockpit radios can only be used as pupil-TX. According to Multiplex, the Cockpit can be used as master transmitter with the Pico-line as slave, but **only** with the specific cable ref. 85122 (+/-23 Euro). The Cockpit can of course be used as slave transmitter with his "bigger" brothers of Multiplex (and other brands…). According to Dutch contacts, the tric of that specific lead consists of making the HF-part inoperative from one transmitter and activate the HF-part of the other transmitter at the same time (by means of a switch that bridges connection 3 and 5).

Robbe : fig. 3-04

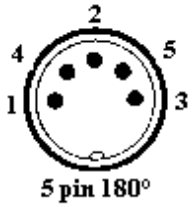


Fig. 3-04

Contact pin configuration viewed on female plug mating face :
2 = Ground
1 = OUT
4 = IN
3 = +V batteries
5 = +V batteries (SWITCHED)

Some transmitters of this brand (CM-Rex,Terra Top FMSS/PCMS, ...) have for the neutral of the servos the choice between an impulse of 1.3 msec or 1.5 msec. The present standard for servos is 1.5 msec (except for Multiplex, see chap. 1) and the dipswitch here for must thus be set in this position as to correspond as close as possible with the recent transmitters.

Sanwa/Airtronics : fig. 3-04 (some info from the excellent site of P. Touzet :

www.multimania.com/silicium31/RC2PC, completed by André Gerbelot (ddgba@wanadoo.fr) and mr.rc-cam)

I never had a Sanwa in my hands...

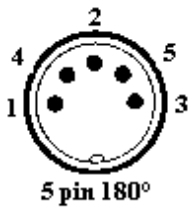
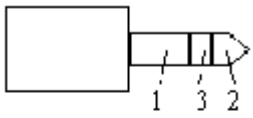


Fig. 3-04

Contact pin configuration of Sanwa viewed on female plug mating face :
1 = ??
2 = Ground
3 = OUT
4 = +V switched
5 = IN
It seems that the Sanwa/Airtronics Infinity, Quasar and Stylus are fitted with other connectors and that for buddy box purpose these transmitters are only compatible with

an identical transmitter (thus Infinity to Infinity, Stylus to Stylus **or** Quasar, Quasar to Quasar). No problem between the RD8000, RD6000, VG400, VG600, Radiant and Vanguard PPM.

Graupner :



jack stereo 3.5 mm

1 not used / non utilisé
2 Signal OUT / IN
3 Ground

Fig. 3-06

The buddy box for most of these transmitters (or for all??) are optional. The buddy box of Graupner transforms the electrical PPM-signal in an optical signal, send by the optical buddy lead Graupner to the other transmitter, in order to be transformed again into an electrical signal. The buddy box will cost you +/- 30 Euro, the lead 70 Euro!!
For the connections of this lead (fig. 3-06), I refer to P. Touzet on his site as mentioned above.

JR :

For buddy box purpose, JR is using the same mono jack 3.5mm plug as Futaba (signal on the tip of the plug, see fig. 3-02).
From the following transmitters, I know that the female buddy box plug is standard fitted :
X-3810, X-388, X-347, X-756.

For those who still did not understand what to do :

See chapter 7 for some examples of buddy leads.

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