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**Radio Controllers for ARC-52 and PTR-175 radios**

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12 Jul 2016 09:51 - 12 Jul 2016 09:54 #29629

ScottBouch created the topic: **Radio Controllers for ARC-52 and PTR-175 radios**

Hi,

Here's a sneak preview of these controllers, proper, correctly aligned, and high res photos will be available soon, these were just snapped with my phone as I found the controllers in the garage.

For this discussion, the T5 and F6 used the PTR-175.

The ARC-52 (UHF only) controller is on the left, the PTR-175 (UHF and VHF) is on the right.



(/media/kunena/attachments/2199/ARC52-PTR175-01.jpg)



(/media/kunena/attachments/2199/ARC52-PTR175-02.jpg)



(/media/kunena/attachments/2199/ARC52-presets-01.jpg)



(/media/kunena/attachments/2199/PTR175-presets-01.jpg)

They show how the preset channels can be set, using rows of little sprung studs on a drum that can be slid along to different locations using the tool supplied on the string in the lid. The red figure on the left shows which channel you're setting, then you rotate the larger knob and the drum rotates round to operate a row of microswitches with the studs.

Lets say we want to set channel 5, you rotate the selector knob until the red channel 5 indicator is shown, then you set the studs with the tool. Then you rotate the channel selector knob to channel 5, the studs you just set on the drum will now be aligned with the row of microswitches inside the back of the controller.

These were used in many, many British cold war aircraft.

Cheers, Scott.

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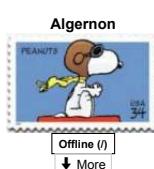
Attachments:



The following user(s) said Thank You: Algernon

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return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9IZs1saWdodG5pbmctdDUtZjYvNjMxNC1yYWRpbby1jb250cm9sbGVycy1mb3ItYXJjLTUyLWFuZC1wd or Create an account (/index.php/log-in?view=registration) to join the conversation.



© 12 Jul 2016 09:57 #29630

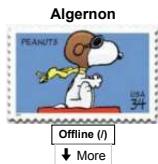
Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios

Superb! Thanks very much for that. Suffice to say, on our version, channel presets will be set using an XML file! 😊

Presumably, you also set the Guard frequency in the same manner, perhaps by finding a G on the red ring?

Looking forward to getting this baby modelled!! 😍 I love a U/VHF!

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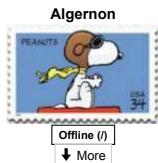
⌚ 12 Jul 2016 09:58 #29631

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

The G is there in the photo, I just noticed!!

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Algernon  
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⌚ 12 Jul 2016 10:03 #29632

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Scott, what would be really amazing is if you could get close-ups of the frequency window on the PTR-175 set to varying frequencies that show all the digits, so I can create a moving texture for each digit wheel. So I guess that would be 123.45, 456.70 and so on?

Also would be useful to know if the most right-hand (10hz?) wheel ever shows anything other than 0 or 5 - many modern units don't bother with single increments, but with a mechanical display I don't know whether that still counts...

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ScottBouch  
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⌚ 12 Jul 2016 10:18 - ⌚ 12 Jul 2016 10:21 #29633

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Algernon wrote: Superb! Thanks very much for that. Suffice to say, on our version, channel presets will be set using an XML file!



Presumably, you also set the Guard frequency in the same manner, perhaps by finding a G on the red ring?

Looking forward to getting this baby modelled!! 😊 I love a U/VHF!

Guard has two modes of operation:

The Guard preset channel G is tunable just like the other channels for two-way comms. But, this would normally be left set to 243.0 Mhz.

There is an independent Guard Receiver (receive only) built into

the radio T/R unit that is fixed at 243.0 MHz, this can be activated by selecting T/R+G on the controller, which leaves the main transmit and receive frequency to whatever is set on the controller, but also mixes the received guard signal into the headsets.

Setting the channel selector to M allows for manual tuning via the knobs and display at the top.

Cheers, Scott.

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⌚ 12 Jul 2016 10:26 - ⚖ 12 Jul 2016 10:28 #29634

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Algernon wrote: Scott, what would be really amazing is if you could get close-ups of the frequency window on the PTR-175 set to varying frequencies that show all the digits, so I can create a moving texture for each digit wheel. So I guess that would be 123.45, 456.70 and so on?

No problem.

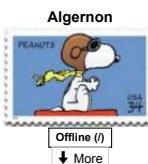
Algernon wrote: Also would be useful to know if the most right-hand (10hz?) wheel ever shows anything other than 0 or 5 - many modern units don't bother with single increments, but with a mechanical display I don't know whether that still counts...

The PTR-175 was only fine-tunable in 0.05 Mhz (50KHz) steps, no finer, so the last digit is either 0 or 5, have a look here:  
[www.scottbouch.com/PTR-175-and-ARC-52-general-and-technical-information.html](http://www.scottbouch.com/PTR-175-and-ARC-52-general-and-technical-information.html) (<https://www.scottbouch.com/PTR-175-and-ARC-52-general-and-technical-information.html>)

Cheers, Scott

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⌚ 12 Jul 2016 10:27 - ⚖ 12 Jul 2016 10:40 #29635  
**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Ah, okay, so the guard monitor on the function selector is fixed at 243.0 MHz regardless of the G preset? That's good to know, I assumed it followed the preset. Will need to find out if that's the same on the later U/VHF fitted to the Victor (currently not working properly for some reason, it went unserviceable after a new FGFS version was released) as I coded it to follow the preset guard frequency.

My intention is to use FGFS's COM2 (com[1] in the property tree) for the guard functionality, as I believe the Lightning only has one general use U/VHF? I'm not counting emergency equipment here, as I don't think it's worth the trouble coding in FlightGear. It's possible to use both Com1 and Com2 radios if you run an extra instance of FGCom outside of FGFS and add a small protocol file. We don't really use FGCom much as Teamspeak is more flexible, but personally I like having the functionality for both to be used as other FG users (particularly ATC) do use FGCom and it's good to have, even just for monitoring the busses on a long flight.

I just thought of something else - can you advise on the direction of the two panel (pillar-type) lights? It looks like they illuminate downwards - if that's the case, is the frequency display backlit or sidelit somehow?

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**ScottBouch**  
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⌚ 12 Jul 2016 11:01 - ⚖ 12 Jul 2016 11:11 #29636

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Algernon wrote: Ah, okay, so the guard monitor on the function selector is fixed at 243.0 MHz regardless of the G preset? That's good to know, I assumed it followed the preset. Will need to find out if that's the same on the later U/VHF fitted to the Victor (currently not working properly for some reason, it went unserviceable after a new FGFS version was released) as I coded it to follow the preset guard frequency.

Yes, the independent receiver is frequency fixed.

However, the Victor *may* have the PTR-1751 (UHF only) which is tunable to more decimal places, and a radio I'm not too familiar with, so don't know about its guard functionality, but I do have the manual for it so can read up if it helps. If the Victor you're modelling has the PTR-175 as discussed here, then the operation will be the same as the Lightning regarding Guard.

Algernon wrote: My intention is to use FGFS's COM2 (com[1] in the property tree) for the guard functionality, as I believe the Lightning only has one general use U/VHF? I'm not counting emergency equipment here, as I don't think it's worth the trouble modelling in FlightGear. It's possible to use both Com1 and Com2 radios if you run an extra instance of FGCom outside of FGFS and add a small protocol file. We don't really use FGCom much as Teamspeak is more flexible, but personally I like having the functionality for both to be used as other FG users (particularly ATC) do use FGCom and it's good to have, even just for monitoring the busses on a long flight.

Yes, modelling the standby UHF radio seems a bit much for a sim aimed at gaming rather than flight exams! really, the only real world interaction with the standby radio is one switch in front of the pupils stick to select it instead of the normal radio. You could always use this switch in the same manner as tuning the controller to G, as the function would be the same, without having to model a whole new radio.

Algernon wrote: I just thought of something else - can you advise on the direction of the two panel (pillar-type) lights? It looks like they illuminate downwards - if that's the case, is the frequency display backlit or sidelit somehow?

Ah, now this is where the magic happens! They are not pillar lamps, but instead the bulbs (same "p" bulb type as in pillar lamps) sit below the surface, you're just seeing the thumb screw and rubber gasket to remove the bulb carrier. The bulbs sit in a perspex tube of the bulb carrier, the light shines through this, sideways. The front panel is made from a layered or laminated perspex, but is painted black. the lettering is etched into the perspex after painting, through the top surface, into a thin white plastic layer, and the main perspex sits below here. The white makes the lettering stand out in daytime against the black paint, however, at night time, the lamps shine through the perspex, through the thin white layer illuminating the lettering.

The light shines through the edge of the perspex onto the rotary manual figures.

I'll power these up for you to see what the look like illuminated.

This same technique is employed with the autopilot controller, and I believe the IFF/SSR unit, and speaking for the T5:

- the switch panels in front of the sticks
- the seat raise / lower, oxygen/airmix and rudder trim panels
- the Ventral tank jettison panel

The lettering glows red or white (depending on what colour perspex tube is installed, red or clear). The brightness is controlled by several knobs around the cockpit. There are also pillar lamps for instruments, and some floodlighting to the sides above the throttles, and also int he top of the canopy pointing forward.

I've seen white crayon also rubbed into the etched lettering to make the lettering stand out clearer in the daytime.

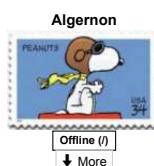
Cheers, Scott.

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The following user(s) said Thank You: Algernon

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© 12 Jul 2016 11:17 #29637

Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios

ScottBouch wrote:

Algernon wrote: I just thought of something else - can you advise on the direction of the two panel (pillar-type) lights? It looks like they illuminate downwards - if that's the case, is the frequency display backlit or sidelit somehow?

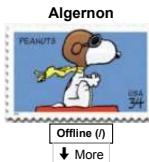
Ah, now this is where the magic happens!

Fantastic 😊 Cockpit lighting is something I'm very hot on - but has to be dealt with carefully because of one (of many) particular FlightGear issues - Rembrandt lighting. Rembrandt is a system which creates realistic spot and point lighting, which is fantastic, but unfortunately, it isn't compatible with other FGFS visual effects (like Atmospheric Light Scattering) as a result of two people working on similar projects more or less separately (a common problem with badly managed open source projects - I am guilty of it myself, so not judging (much)). Rembrandt is also not being developed anymore I think, and is always under threat of removal from FG but hasn't happened yet. Some people prefer to use Rembrandt and lose the other effects (e.g. myself and Stuart), others don't. I personally think the best compromise is to use Rembrandt if you're flying from dusk onwards, when the other effects are mostly lost because of lack of daylight, and switch it off if you're doing a day flight where internal lighting doesn't matter so much. However, it does affect light shading on 3d models so these days we really need to go in with the dual approach right from the outset. It's not a big problem, just a minor annoyance. Just thought I'd fill you in on the Rembrandt dichotomy 😊

We code conditions into the animations for whether Rembrandt is activated or isn't, and if the 3D materials are done correctly, all should be well. The way I personally go about internal lighting is as follows - an example can be seen in the Victor. You'll need to enable Rembrandt - this is done by setting a property at runtime using FGRun or the command line. The property is sim/rendering/rembrandt/enabled = true.

On the Victor, I've created pillar lights which use a Rembrandt spot. It might be better to use Rembrandt points for the lamps you describe here, but we can come to that later. On more modern aircraft (Typhoon for example), you can select a day/night mode and all the appropriate cockpit lighting switches from white (day) to red (night). But it sounds like this is a manual operation requiring removal of the black holding plate on this unit. So we should probably talk about how the do that - perhaps a preference/menu option to prep the aircraft for day or night operation?

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12 Jul 2016 11:29 - 12 Jul 2016 11:30 #29639

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Victor, with Rembrandt enabled, showing red cockpit floods and pillar lights. The instruments are also backlit for non-Rembrandt operation. All lighting is dimmable using the realistic knobs, as detailed in the pilot notes.



(/media/kunena/attachments/665/fgfs-screen-004-2.png)

Attachments:

 (/media/kunena/attachments/665/fgfs-screen-004-2.png)

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**ScottBouch**



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⌚ 12 Jul 2016 11:35 #29640

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

I see a simple way to do it in the Lightning (speaking as someone who's not a developer) - use the dimmer controls like in the F1A model - when turned down to zero, go to day lighting, anything higher, treat it as dusk / night... if that's possible?

This will give realism to use the real controls too for the panel lighting, as the F1A.

Cheers, Scott

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**Algernon**

[PEANUTS](#)

**Offline (I)**

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⌚ 12 Jul 2016 11:43 #29641

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

If the dimmer is down to zero, wouldn't there be no lighting? Or would zero on the rheostat just give minimum as opposed to no lighting in real life?

If the red or white lens is something that was changed regularly by the ground crew, it could easily be switched using the "ground services" dialog box which will also control things like ground power and ground refuelling. Alternatively, if the lenses weren't regularly changed, we could just leave them as red as it's unlikely (in FG) you'd need any cockpit lighting during daylight hours...

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return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9lZS1saWdodG5pbmctdDUtZjYvNjMxNC1yYWRpbby1jb250cm9sbGVycy1mb3ItYXJjLTUyLWFuZC1wd or Create an account ([/index.php/log-in?view=registration](#)) to join the conversation.



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⌚ 12 Jul 2016 11:48 - ⌚ 12 Jul 2016 11:52 #29642

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Hi yes, the dimmer being at zero means no lighting, as you'd have it in daytime. I think I may have misunderstood the concept of the two options available, I'll go and re-read.

the colour wouldn't have been changed around for preferences. Red is the norm, but I have also seen clear / white lettering bulb carriers, possibly from different aircraft. OR possibly from ground or control tower use (these radios were also used in control towers, and there was a portable field version, they all used the same controllers, but may have had different colour lamps for this reason?? perhaps...)

Other notes:

The only back-lit instruments in the Lightning are the main artificial horizon, compass, Tacan, ILS unit, the ASI and the E2B last resort compass. The rest of the gauges rely on pillar lamps.

This video doesn't really show the instrument lighting, but I don't think I have anything better:

### English Electric Lightning T5 Cockpit, power ON!



Really need an evening at Cranfield with the camera...

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12 Jul 2016 12:07 - 12 Jul 2016 12:14 #29644

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

ScottBouch wrote: Really need an evening at Cranfield with the camera...

Yes please! 😊 Some good quality photos to use as textures would be absolutely amazing - the old F1A ones, while impressive, are very old and very low res. The Alphasim ones Stuart converted are better, but still not as good as what's possible now (even on a phone). Anything we can get to modern standards for texturing would be spectacular to work with.

OK, I think we understand each other. We'll set the units to have red lenses, no option, I think, based on your update above, as during the day, you won't see the illumination anyway, either with Rembrandt enabled or disabled. From what I can tell from the vid and your notes, we need backlighting for the main IFIS stuff (ALT/VSI, flight director, nav display and ASI) - well that's already done, actually, but the dimmer knob isn't modelled yet. I think I also put in a few pillar lights... and backlighting for the backup compass.



(/media/kunena/attachments/665/fgfs-screen-005-2.png)

Yes - except, now privy to your information about the method of lighting radio units etc., I can see I have wrongly added pillar lights to the FCS/AP unit and transponder. Pillar lights are (not very well) installed above the RPM gauges (will fix that when we remodel them as per your request in the other thread)

Attachments:

(/media/kunena/attachments/665/fgfs-screen-005-2.png)

(/media/kunena/attachments/665/fgfs-screen-005-2.png)

Please Log in (/index.php/log-in?  
 return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9IZS1saWdodG5pbmctdDUtZjYvNjMxNC1yYWRpb1jb250cm9sbGVycy1mb3ItYXJjLTUyLWFuZC1wd  
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**ScottBouch**

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12 Jul 2016 12:42 - 12 Jul 2016 12:45 #29646

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Here's some details on the PTR-175 controller and it's illumination:

Red and clear lamp holders and 'P' bulbs.



(/media/kunena/attachments/2199/ARC52-PTR175-lamp-holders-01.jpg)

One rubber gasket removed:



(/media/kunena/attachments/2199/ARC52-PTR175-lamp-holders-02.jpg)



(/media/kunena/attachments/2199/ARC52-PTR175-lamp-holders-03.jpg)

Laminated perspex panel, you can see the thin white layer just under the surface, and then the thick Perspex:



(/media/kunena/attachments/2199/PTR175-laminated-perspex-01.jpg)



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(/media/kunena/attachments/2199/PTR175-laminated-perspex-02.jpg)

You can see how the lettering is etched through the outer layer:



(/media/kunena/attachments/2199/PTR175-laminated-perspex-03.jpg)

Shall we break out a new topic to cover cabin lighting in general, and keep this one about these controllers?

Cheers, Scott

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[www.scottbouch.com/classic-aviation.html](http://www.scottbouch.com/classic-aviation.html) (<https://www.scottbouch.com/classic-aviation.html>)

Attachments:

<a href="#">PTR175-lamp-holders-01.jpg</a>	<a href="#">PTR175-lamp-holders-02.jpg</a>	<a href="#">PTR175-lamp-holders-03.jpg</a>	<a href="#">PTR175-laminated-perspex-01.jpg</a>	<a href="#">PTR175-laminated-perspex-02.jpg</a>	<a href="#">PTR175-laminated-perspex-03.jpg</a>
<a href="#">PTR175-laminated-perspex-01.jpg</a>	<a href="#">PTR175-laminated-perspex-02.jpg</a>	<a href="#">PTR175-laminated-perspex-03.jpg</a>			
<a href="#">PTR175-laminated-perspex-01.jpg</a>	<a href="#">PTR175-laminated-perspex-02.jpg</a>	<a href="#">PTR175-laminated-perspex-03.jpg</a>			

03.jpg)

[\( /media/kunena/attachments/2199/PTR175-laminated-perspex-03.jpg \)](#)

The following user(s) said Thank You: Algernon

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return=aHR0cDovL3d3dy5mZ3VlMv1L2luZGV4LnBocC9mb3J1bS9lZS1saWdodG5pbmctdDUtZjYvNjMxNC1yYWRpbby1jb250cm9sbGVycy1mb3ltYXJlTUyLWFuZC1wd or Create an account ([/index.php/log-in?view=registration](#)) to join the conversation.

Algernon



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12 Jul 2016 12:56 #29647

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Yes, lets do that. Would it be worth starting a topic in a new category, seeing as lots of Cold War era aircraft used similar techniques and often the same kit? I'm trying to get some more focused organisation into our development discussions as well as hangar storage, as our hangar is now enormous, but I think it's fair to say aircraft of this era are a big part of our development effort. I'd quite like to run a poll for reorganisation - this could be a good start.

Let me think about it over lunch and get back to you, but yes, we'll definitely move illumination somewhere else and get back to radios! 😊

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ScottBouch



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12 Jul 2016 13:23 #29653

**ScottBouch replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

Oops, I just started the ball rolling in a T5 dedicated section before I read that! and 80% of what I just published are common aircraft parts.

It makes sense to have a common repository for all common parts though, as updates can filter down to all aircraft.

Cheers, Scott.

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return=aHR0cDovL3d3dy5mZ3VlMv1L2luZGV4LnBocC9mb3J1bS9lZS1saWdodG5pbmctdDUtZjYvNjMxNC1yYWRpbby1jb250cm9sbGVycy1mb3ltYXJlTUyLWFuZC1wd or Create an account ([/index.php/log-in?view=registration](#)) to join the conversation.

Algernon



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12 Jul 2016 13:31 #29656

**Algernon replied the topic: Radio Controllers for ARC-52 and PTR-175 radios**

It's fine, no problem doubling up here anyway as it's a useful developer reference 😊