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**Real PTR-175 and ARC-52 Control Unit Integration with FGFS**[Start](#) [Prev](#) [1](#)[2 \(/index.php/forum/hardware-integration/6362-real-ptr-175-and-arc-52-control-unit-integration-with-fgfs?start=20\)](#)[Next \(/index.php/forum/hardware-integration/6362-real-ptr-175-and-arc-52-control-unit-integration-with-fgfs?start=20\)](#)[End \(/index.php/forum/hardware-integration/6362-real-ptr-175-and-arc-52-control-unit-integration-with-fgfs?start=20\)](#)

ScottBouch

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🕒 28 Jul 2016 12:41 - 📅 28 Jul 2016 20:35 #30114

**ScottBouch created the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Following on from here (<http://www.fguk.eu/index.php/2013-09-03-13-01-02/hardware-integration/6332-hardware-integration-first-steps?start=60#30009>) with regard decoding the frequency settings to control FGFS radio frequencies....

I have a cable that connects either the PTR-175 or ARC-52 control units to this box, the "Interconnecting Box". I don't want to modify the cable (it's rare) or the control Units (they are expensive), so I'm planning on modifying this tattier Interconnecting Box to use it as a " Break-Out-Box ([https://en.wikipedia.org/wiki/Breakout\\_box](https://en.wikipedia.org/wiki/Breakout_box)) ". I have another one the same in much better condition that I want to keep that way for radio demonstrations.

This box is where the party happens in an ARC-52 or PTR-175 radio system. It's where the following elements all come together:

- Power Supply
- Control Unit
- T/R Unit
- Muting Unit
- Panel lighting control
- Mic / Tel sockets
- Press To Transmit buttons
- Tone switch (for homing)
- Aerial changeover relay

We're interested in the Cannon socket where the Control Unit connects, as this will give us access to all of its connections, and we'll be able to decode the frequency from there.

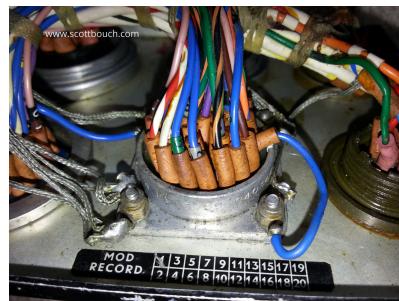


(/media/kunena/attachments/2199/old-interconnecting-box-01.jpg)



(/media/kunena/attachments/2199/old-interconnecting-box-02.jpg)

The plan will be to bring a ribbon cable out the side through the join between the lid and the back, and get it off to an Arduino Mega board. Ideally I'll lift the sleeves of these cables up and solder the ribbon cable wires to the backs of these pins, maintaining the original wiring connection (to allow the box to still be used in its intended form), but this may not be possible with how tight it is!



(/media/kunena/attachments/2199/old-interconnecting-box-03.jpg)

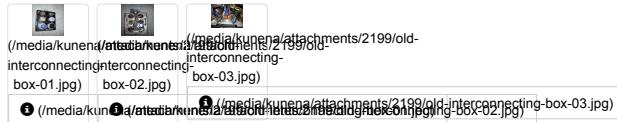
I've seen these boxes used in Jet Provost and Vulcan installations. These boxes were also used in control towers where a rack of ARC-52's or PTR-175's would live all tuned to the various airfield frequencies, plus mobile radio sets too. The Lightning uses a more complex AF Unit, which helps to provide homing capabilities, but still provides the basic functions. The Folland Gnat uses its own version, a triangular affair, to fit in the shape available in the aircraft! I've not seen what setup is used on other aircraft, but it'll either be an Interconnecting Box like this, AF Unit, or similar.

Cheers, Scott.

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## Real PTR-175 and ARC-52 Control Unit Integration with FGFS - FGUK Forum

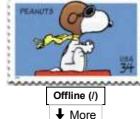
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return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9oYXJkd2FyZS1pbnRlZ3JhdGvb82MzYyLxJlYWwtcHRyLTE3NS1hbmQtYXJlTUYLWNvbnRyb2wtdW5pdC1pb

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**Algernon**

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28 Jul 2016 20:53 #30117

**Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Dude,

Sorry, I have been meaning to reply properly to your post in the other thread about this.

I think your plan of using the ribbon cable is a good one - as you say, it's less expensive or rare than the other bits. I've already more or less worked out my approach on the software side now - I'm almost glad I didn't have time for coding this week, but could muse upon it on the train.

I'm going to basically create a software "interconnecting box", which will either route or simulate as many of the signals that are relevant to what FlightGear is capable of, or what is genuinely useful. This will give you one place in the Property Tree to "break out" whatever you want to (I used the term "Break Out Box" in my notes too 😊). Based on your very useful information, here are my initial thoughts:

Each socket will have a property node, named after its socket number as defined in your circuit diagram. The principal ones will be the Control Unit and T/R unit nodes, giving you a software construct of the connector with the pins correctly labelled. Panel lighting and tone will, presumably, be software driven - 1k tone is easy, and panel lighting will come from the existing rheostat in the Lightning, which reminds me - how do you think the best way to get 12v into the box to be sent to the panel lighting pin? I intend to provide a property for this, which can take a settable offset in the same branch to easily balance the software and hardware illumination. At the moment, the property is in volts for the software controller - this will be normalised at the interconnecting box which, I guess, makes things a bit simpler at the Arduino end.

There will be properties for stuff that may be useful later, but at the moment will most likely be done by FlightGear - PTT, muting unit, I might even build in potential for aerial simulation, but that seems like going a bit far! 😊 I guess it is worth thinking about connectivity to a helmet, too, seeing as you've got so many of them. My plan is to build an RPi to handle mic traffic - at first using a USB headset, but later, hopefully, a mic preamp and headphone amp to drive a real flight helmet. If you at some point want to plug in a headset, it might be worth soldering on some screened audio cable to the mic/tel socket while you're in there.

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return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9oYXJkd2FyZS1pbnRlZ3JhdGvb82MzYyLxJlYWwtcHRyLTE3NS1hbmQtYXJlTUYLWNvbnRyb2wtdW5pdC1pb

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**ScottBouch**

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29 Jul 2016 10:36 - 29 Jul 2016 11:43 #30124

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Hi,

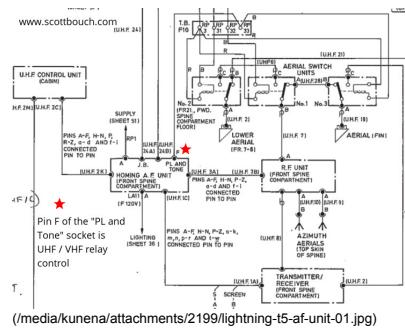
**Tone:**

I've been looking through the Lightning wiring diagrams, and I'm struggling find that the Tone function is used from a cockpit control.

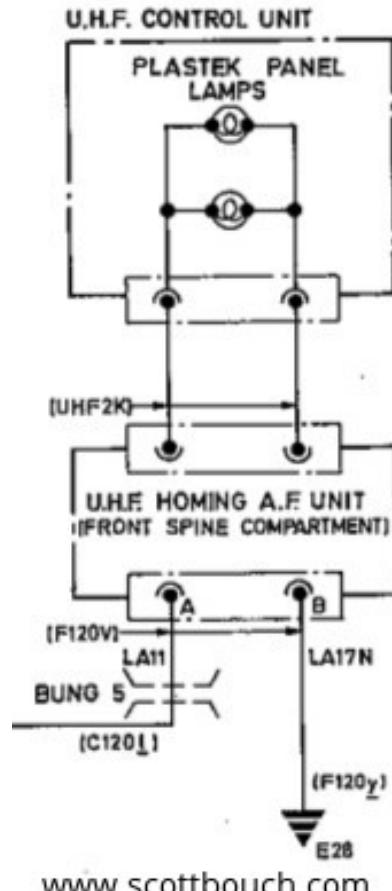
The AF unit itself may tell the radio to transmit the Tone, due to interactions with the other homing systems, but as far as any manual controls go, I can't find it wired at all, nor can I remember seeing a button or switch marked Tone. I think the Homing AF

Unit gives us a different spin on some aspects.

I can find two connections to the AF Unit's PL & Tone socket, this is for Panel Lighting, and UHF / VHF aerial relay.



(/media/kunena/attachments/2199/lightning-t5-af-unit-01.jpg)



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(/media/kunena/attachments/2199/lightning-t5-af-unit-02.jpg)

These two diagrams show pins A, B and F used for UHF / UHF aerial selection (F), and also panel Lighting (A & .

However, looking at this image of XS458, it does appear that there are more than 3 wires connected, I've put a red star next to the Homing AF Unit's equivalent PL & Tone socket:



(/media/kunena/attachments/2199/lightning-t5-af-unit-03.jpg)

Picture from here: [www.scottbouch.com/English-Electric-Lightning-technical-resource.html](http://www.scottbouch.com/English-Electric-Lightning-technical-resource.html)

So, I'd say not to worry too much for now about Tone, as we don't know if or how it works in a Lightning Homing AF Unit. But we may find for simpler aircraft such as Jet Provost that use the Interconnecting Box, it may have a manual switch. But further to that, would there actually be a use for it in the Flightgear game? I assume you'd only want to use it if you're lost and want someone else to home into your 1khz audio transmissions, you could always just hit escape and start the game again!

#### ***Lighting:***

I think the best way to achieve software controlled dimmable Lighting is to take an output from the Arduino to a PNP transistor, with the Emitter up to +V, and the Collector to the Interconnecting Box, Pin P of the Cannon socket for the control unit. the bulbs are grounded to the chassis of the controller, which will need a ground connection back to the Arduino, and the bulb power supply, via Pins L or N of the Cannon Control Unit connector.

I don't think we'd really need aerial selection (or Tone), but if you're modelling the software around the physical connections, there's no harm in laying the foundations for a future possibility!

I agree with what you said about focusing on the essentials of the system, but as it's a very modular sounding piece of software design, other functions such as homing can be added later if needed:

- Frequency selection
- Radio Volume control
- Radio Mode control (T/R+G, ADF etc.)
- Panel Lighting
- PTT
- Radio Mute

Cheers, Scott.

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 return=aHR0cDovL3d3dy5mZ3VrLmV1L2uZGV4LnBocC9mb3J1bS9oYXJkd2FyZS1pbnRIZ3JhdGlvb182MzYyLXJlYWwtcHRyLTE3NS1hbmlQtYXJjLTUyLWNvbnRyb2wtdW5pdC1pb or Create an account (/index.php/log-in?view=registration) to join the conversation.



© 29 Jul 2016 11:49 - © 29 Jul 2016 13:25 #30125

Algernon replied the topic: Real PTR-175 and ARC-52 Control

**Unit Integration with FGFS**

Am mobile, so will only address the points I want to ponder over my pub lunch for now 😊

The ADF output is something I do want to get right. I may not have time to pore over the diagrams before this evening, could you perhaps give me a brief overview of how it works? As I understand it as far as the C16074 is concerned, the ADF mode position allows voice comms as usual on the selected channel preset, while sending the manual select frequency to the ADF system. But how? The control unit can apparently only send one frequency to the T/R via the interconnecting box, and that is not necessarily the correct frequency for the ADF.

Other than that, mode selection is easy peasy. PTT is similarly easy.

Oh, how about radio mute? I use it already for PTT muting (you can get optional AF click, TX whine and pre-squelch static bursts SFX on keying PTT by the way) but this is done internally in the T/R unit - I presume the external connection for muting boxes, at least on the Lightning, is to mute the radio but not the intercom or important aural warnings...?

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 return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9oYXJkd2FyZS1pbnRlZ3JhdGlvbi82MzYyLXJlYWwtcHRyLTE3NS1hbmQtYXJjLTUyLWNvbnRyb2wtdW5pdC1pb  
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**Algernon**



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⌚ 29 Jul 2016 11:54 #30126

**Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

I just remembered that ADF is something we don't collectively know much about, but it is a core function... so do we make a "best assumption"?

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return=aHR0cDovL3d3dy5mZ3VrLmV1L2luZGV4LnBocC9mb3J1bS9oYXJkd2FyZS1pbnRlZ3JhdGlvbi82MzYyLXJlYWwtcHRyLTE3NS1hbmQtYXJjLTUyLWNvbnRyb2wtdW5pdC1pb  
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**ScottBouch**



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⌚ 29 Jul 2016 13:30 - ⌚ 29 Jul 2016 14:38 #30127

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

**ADF**

So, I've just read from the aircrew manual, that the ADF function of the radio control unit is used for "Violet Picture", which was a UHF only homing system, whereby the aircraft could navigate toward the source of the radio transmissions. I think it uses the same display as ILS, but maybe just the heading element of it as VP appears to only give you a bearing, not range.

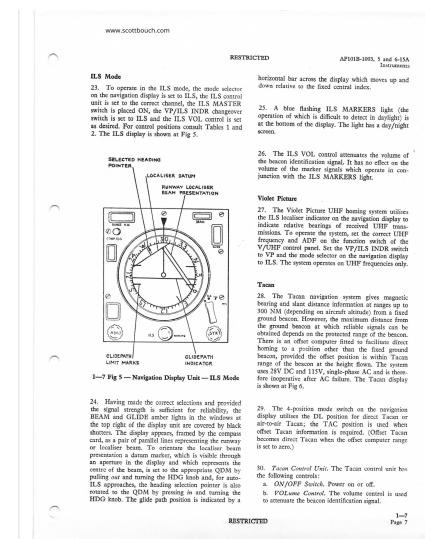
I think you'd have to be tuned to and talking on the same frequency as the one you're homing in on. This may be useful for finding a Victor Tanker, although they also had TACAN transmitters, so maybe as a backup.

I think this may tie into the TONE function, as you could radio the Victor, and ask them to transmit TONE on an agreed frequency for let's say 30 seconds, this may give you enough time to use VP to point you in the right direction of them. So, maybe the Lightning does have a Tone switch somewhere, but I've just not found it yet... as it may be useful for other friendly aircraft to locate you.

I can't find any other reference to the ADF switch position in the Lightning. Other aircraft may have used it through different instrumentation.

Just done a little more scanning, read the Violet Picture paragraph... the cockpit images show where the VP / ILS switch is on panel A3 in the T5.

Info for F3, T5 and F6:



(/media/kunena/attachments/2199/lightning-t5-ADF-VP-01.jpg)

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Table 1 -- Controls and Indicators -- F Mk 3 and F Mk 4

Item No.	Name	Markings	Remarks
1	Instrument master switch	INSTR. MASTER —	Down for off
2	Standby source switch	INVERTER — NORMAL/STANDBY	Guarded to NORMAL
3	Standby source MLI	BLD — STANDBY	
4	Master reference gyro (MRC) switch	MRC — ON	Lock cockpit switch; lift and move down to switch off
5	Attitude indicator PIC	—	See text
6	Navigation display	—	—
7	ILS control switch	Channels marked A to L	—
8	ILS master switch	ILSMASTER — ON	—
9	ILS/PVP selector switch	VP/ILS INVR — ON	—
10	ILS volume control	ILS VOLUME	—
11	Taxis offset computer	See text	—
12	Taxis offset computer	BEARING/RANGE NM	—
13	Speed display	See text	—
14	Altimeter	See text	—
15	ECAM	See text	—
16	Pilot harness switch	PITOT HEATER — NORMAL/OFF/STANDBY	—
17	Standby artificial horizon	—	—
18	Direction indicator (DI)	—	—
19	Standby A3I	—	—
20	Standby compass	—	—
21	Radio altimeter (pose-mod 4466)	—	—
22	Landing gear warning light	—	—
23	ETB compass	—	—
24	Altitude indicator	—	—
25	Ram air temperature gauge	—	—

Table 2 -- Controls and Indicators -- T Mk 5

Item No.	Name	Markings	Remarks
1	Instrument master switch	INSTRUMENT. MASTER — ON	Down for off
2	Standby source switch	INVERTER — NORMAL/STANDBY	Guarded to NORMAL
3	Standby source MLI	BLD — ON	
4	Master reference gyro (MRC) switch	MRC — PULL-OFF	Indicator light
5	Attitude indicator PIC	—	See text
6	Navigation display	—	—
7	ILS control switch	Channels marked A to L	—
8	ILS master switch	ILSMASTER — ON	—
9	ILS/PVP selector switch	ILS/PVP INVR	—
10	ILS volume control	ILS VOLUME	—
11	Taxis offset computer	See text	—
12	Taxis offset computer	BEARING/RANGE NM	—
13	Speed display	See text	—
14	Altimeter	See text	—
15	Pilot harness switch	PITOT — ON/OFF/STANDBY	—
16	Standby artificial horizon	—	—
17	Direction indicator (DI)	—	—
18	Standby A3I	—	—
19	Standby compass	—	—
20	Standby altimeter	—	—
21	Astrocompass	—	—
22	Ram air temperature gauge	—	—

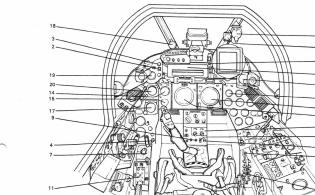
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Page 2  
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(/media/kunena/attachments/2199/lightning-t5-ADF-VP-02.jpg)

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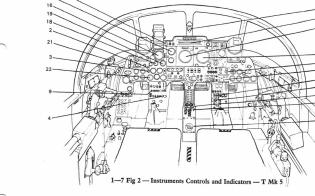
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(/media/kunena/attachments/2199/lightning-t5-ADF-VP-03.jpg)

NOTE - Switch 9 is arrowed to the wrong switch in the drawing!! I'll provide some switch layout info in the Lightning development section.

#### T5 Muting:

Info for T5 only.

The main radio can be muted by the instructors stick button a button on panel A3, or one on panel A6.

The separate intercom amplifier can't be muted, but it's power can be turned off by the intercom switch on panel A3, but you wouldn't want to do that.

Additionally, the warning panel (below the autopilot controller) has a muting function too to just decrease the volume of the attention - getting "clangers" / warning sound.

**Muting switches**

24. To enable the pupil and instructor to converse freely through the inter-comm. system, unwanted signals can be attenuated by the use of muting switches. The volume of incoming radio signals can be reduced by any one of three muting switches, one on the U.H.F. switch panel A3, one on panel A6 and one on the instructor's control column handle. All switches are spring loaded to the NORM position. A pull-to-operate switch on panel A1 is used to reduce the volume of the audio warning system signals when required.

(/media/kunena/attachments/2199/lightning-t5-muting-swthes-01.jpg)

I think there's a mistake in this text.. I think the A3 panel muting switch is non momentary, ie: you can leave it muted without having to hold it. The pilots notes flip book says to check it's not muted as one of the internal checks.

I'm not sure if the single seaters have an intercom amplifier, as the only use it would be for would be to talk to the ground crew. I'm currently trying to get some F3 and F6 electrical / radio info.

Cheers, Scott.

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29 Jul 2016 13:52 - 29 Jul 2016 13:55 #30129

ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS

NOTE:

[Since I'm learning this side as I go along, i'm noticing things, and putting the pieces together as I go...]

Some aircraft pilots manuals state that on the radio controller, ADF, and D/L is not used.

Vulcan B2 aircrew manual:

d. A 7-position function switch, giving selection of:  
 OFF  
 T/R, normal transmission and reception  
 T/R + G, with guard frequency superimposed on reception  
 ADF  
 DL  
 DL/T } inoperative  
 T/R ON-D/L OFF  
 (/media/kunena/attachments/2199/vulcan-B2-C1607-4-controller-modes-01.jpg)

Jet Provost Mk3A aircrew manual:

6. *VIUHF Control Unit (PTR 175)*. The following controls are provided (Fig 1):

a. *Function Switch*. The function switch is a 7-position rotary switch of which only the first three positions (OFF, T/R, T/R+G) are used. Selecting T/R permits selection of any required frequency for transmission and reception. The T/R+G position retains normal frequency selection but adds a guard frequency receiver to normal reception.

(/media/kunena/attachments/2199/JP-Mk3a-C1607-4-controller-modes-01.jpg)

I know the vulcan and Jet Provost both use the Interconnecting Box, not a Homing AF unit, so am piecing two and two together here:

So, I'm going to make an assumption: To Use ADF, the aircraft would need a homing system, like the AF unit of the Lightning, instead of the simple Interconnecting Box. Aircraft with an Interconnecting Box would only need to use controller modes T/R and T/R+G. anything more would need a Homing AF Unit.

This may put a new spin on the software you are modelling, maybe two versions are needed, both can share the same core code, but the aircraft with a Homing AF unit, or similar would need the ADF function too.

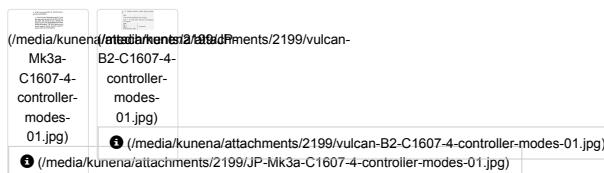
Wow, that was a learning experience!!

Let's not start on Data Link (D/L) as I the information is scarce - I think it was quite secret. The equipment associated with it in XS458, the selector address unit, head sound reproducer etc., all was removed before the aircraft left service. I know the function was that the Head sound reproducer contained tapes of pre-recorded voice messages, the received data would select a tape to play to the pilot. A way of getting secret messages to the aircrew that couldn't be deciphered.

Cheers, Scott.

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29 Jul 2016 14:03 - 29 Jul 2016 14:05 #30130

ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS

Read the last post here: [www.vintage-radio.net/forum/showthread.php?t=34948](http://www.vintage-radio.net/forum/showthread.php?t=34948) (<http://www.vintage-radio.net/forum/showthread.php?t=34948>)

It talks of helicopters with ARC-52's and a Violet Picture display, used for locating Personal Locator Beacons, such as SARBE for people lost at sea.

unfortunately he doesn't mention the additional equipment between the ARC-52 and the display unit.

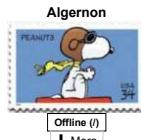
Cheers, Scott.

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The following user(s) said Thank You: Algernon

## Real PTR-175 and ARC-52 Control Unit Integration with FGFS - FGUK Forum

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29 Jul 2016 14:51 - 29 Jul 2016 14:51 #30131

Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS

ScottBouch wrote: So, I've just read from the aircrew manual, that the ADF function of the radio control unit is used for "Violet Picture", which was a UHF only homing system, whereby the aircraft could navigate toward the source of the radio transmissions. I think it uses the same display as ILS, but maybe just the heading element of it as VP appears to only give you a bearing, not range.

I know that the Victor used a few selector switches to direct radio beacon information (bearing and range) to the Smiths Military Flight System (otherwise known as the Mystery Flight System) and, if desired, to the autopilot too. The Nav Plotter/Nav Radar stations could select which of their various bits of kit (bombing computer, Carousel INS, Omega or HF ADF) could be picked up by the pilots by choosing "Remote" on the MFS direction selector on the centre console. On our Victor, this is currently constantly set to the Garmin GPS output as the other systems are not modelled yet. In addition, the pilots had their own choice of flight direction routed to the MFS by selecting "LOC" on the MFS direction selector. This in turn was divided between the ILS system (IIRC a channel-based multi-position knob on the overhead panel) and other systems (though I don't know what without looking it up).

I think we'll leave this well alone for now. Similarly, as you say, with Data Link - it seems it didn't really come fully into operation. I'm more interested in continuing to explore a Link 16 data system for contemporary aircraft, where we can actually do quite a lot of the functions actually provided via NATO and British SkyNet satellites.

(Which idiot called it SkyNet? We all know where that particular train Terminates...)

The following user(s) said Thank You: ScottBouch

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29 Jul 2016 14:57 - 29 Jul 2016 15:06 #30132

ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS

Algernon wrote: I think we'll leave this well alone for now.

Gently gently catch the monkey... yes, one step at a time is sometime the best way, as long as you work in a moular fashion, we can always come back later. Violet Picture does seem like quite a straightforward system, and if it could be made to work for FG, it'd be a bit of fun to use it when flying toward others!

I'm happy too have understood the system a bit better on the back of this.. Until tonight's wine, then it'll all go again!

I'll be back, Scott.

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⌚ 29 Jul 2016 21:45 - ⌚ 30 Jul 2016 09:20 #30134

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Military aircraft Mic / Tels....

If you can interface a usb sound card with a Pi, that may just work nicely. Most headsets are quite low power in terms of Watts, so a usb headphone device may be sufficient without amplification.

I bought a £2.00 one from eBay and have successfully used it on a Pi Zero for audio line level out and headphones. I've never tried (never had the need) to try using the microphone side though.

I forget the standard impedances of the microphones and headsets (but have notes somewhere), but there's nothing special about the headphones side. The standard RAF microphone is a moving coil dynamic element (not phantom powered), for boom mics, mask mics and throat mics.

American gear complies to two different standards regarding microphone types, mic and headset impedance, one for the USAF, one for the USN. So countries using American aircraft will likely adhere to one of these standards.

- USAF use moving coil dynamic mics (not phantom powered) connected directly to the aircraft intercom / radio system .
- USN use either amplified electret mics , or amplified dynamic mics (actually USAF standard mic elements), both require 27Vdc phantom power (non polarised, ie; the amplifiers can work connected either way regarding +/-). These small amplifier units live right next to the mic element, so as far as the aircraft interface is concerned, it sees a mic amplifier, and powers it, no matter the element type. This standard harks back to the days of carbon microphones being used, the radio interface is the same, so the mics have to appear as a carbon mic, ie; dc fed from the radio input, and the current varies according to the sound waves, so these mic amplifiers are there to convert a modern mic type to appear electrically as if they were a carbon mic. The USN headphone impedance at the aircraft interface is 600ohms, and as with the microphones, the USN helmets use a transformer to impedance match the lower impedance speakers available for modern helmets. Why the USN hasn't updated it's comms standard to fall in line with the USAF is a bit beyond me.

Soviet built aircraft have their own standards and connector, but again, other countries buying these aircraft will adhere to these standards.

Swiss helmets are an oddball, as they use the Soviet plug & socket, but the opposite way round. Not sure about Swiss impedances though.

Good old France though use the British / RAF standards for impedance, and mic type in French built aircraft.

Luckily these different standards all use different connectors, so you can't accidentally plug the wrong kit into the wrong aircraft! You can happily connect a French helmet to a British military aircraft, as they share the same plug type and impedances and mic type.

And then there's General Aviation / Civil... there's one standard for fixed wing (twin plugs) and another for rotary wing. Unfortunately the GA rotary wing headset standard uses the same plug as USAF headsets, so it is possible to accidentally connect incompatible systems in this case. There are a variety of headset impedances and mic types available for GA, so I think it largely comes down to what radio you happen to have installed in your aircraft.

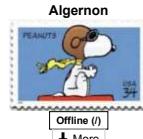
But for FG this is all a bit irrelevant, just for interest sake. Whatever headset and mic an individual ends up using will have to be made compatible with whatever USB sound card they end up using.

I suppose what we can take from this is that someone simulating an RAF setup will engineer it differently to a USN, USAF, or GA setup. There is no one-design-fits-all.

Cheers, Scott

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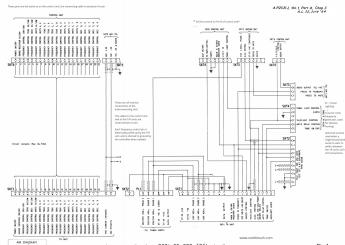


⌚ 31 Jul 2016 09:28 ⓘ 31 Jul 2016 09:28 #30149

**Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Hey Scott,

I don't suppose you have any idea how frequency hundreds are selected with a PTR-175 unit instead of an ARC-52? There is a pin for selection 200 or 300, which is fine for UHF and upper VHF but no good for the lower ranges of the PTR-175 in VHF (it goes down to 130ish).



(/media/kunena/attachments/2199/ARC-52JB\_SB\_annotated.jpg)

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⌚ 31 Jul 2016 10:10 ⓘ 31 Jul 2016 10:47 #30150

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Hi, yes, on the right hand side of the drawing, Pin J of Skt 6, UHF / VHF control...

When the frequency is below (and including / equal to) 130MHz Pin J is grounded, and Pin K is not. Clearly this pin is not used on the ARC-52 controllers (and also Pin B for 50KHz tuning).

Here's the spreadsheet again as it belongs with this topic more, all the pin-out testing is included:

**File Attachment:**

File Name: C1607-4\_Co...sx-2.zip  
 (/media/kunena/attachments/2199/C1607-4\_Controller\_Pin\_Outs.xlsx-2.zip)  
 File Size: 6 KB

Cheers, Scott.

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**Attachments:**

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The following user(s) said Thank You: Algernon

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**ScottBouch**



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⌚ 31 Jul 2016 10:56 - ⚖ 31 Jul 2016 10:58 #30151

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Been thinking about the Mic/Tel side of this unit... I don't think it'd be helpful to direct audio through it. As ideally we'd be using the volume control as an analogue input to FG, and letting the software set the radio volume, we couldn't do this if we had our real audio going through the volume knob. So ideally if all signals from the control unit will just go to the computer for control purposes, it'd be neater.

I really like your RPi box idea for generating the audio. If we leave that as the real world audio interface, then that'll work nicely.

Cheers, Scott

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⌚ 31 Jul 2016 14:02 - ⚖ 31 Jul 2016 14:25 #30152

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Thinking also in terms of building a software interconnecting box.. I'm not sure if it's the right approach....

Only because the Mute and PTT signals would come in from other real world I/O.. ie: from the stick, throttle for PTT and stick and instrument panel for muting... perhaps a philosophy of imitating just the control unit connector may be better, as it leaves you the freedom for the other items to wire them to the I/O board that's local to them, saving a lot of wiring back and forth in a real panel. Same as my thoughts about the Mic / Tel signals.

I'm just thinking about if you were building a mock cockpit, what would be the simplest option. for example a Lightning stick would need the following digital signals:

2 for the trim hat  
 One for the trigger  
 One for PTT  
 One for Mute  
 One for gun camera recording  
 Two for AP mode switch  
 (Plus three analogues for pitch & roll and braking lever)

The throttle box would need:  
 Two for airbrakes  
 One for PTT  
 (Plus two analogues for the actual throttle positions)

So, I'd be tempted to think along the lines of grouping I/O based on it's real physical location to minimise cross-connections, and make a real build more modular.

So for the radio Control Unit, I'd concentrate only on what's accessible through it's connector, and disregard the other connectors of the Interconnecting Box, as some of the functions are nothing to do with the Control Unit.

Different aircraft will have these functions in different places, so if you were building a Victor, it's be a different layout again.

What do you think on taking this philosophy? To me it seems quite logical, but you may see reason to think differently about it. Just thought it's worth thinking deeper about it before heading off down a rabbit tunnel.

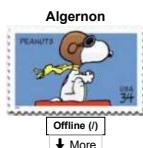
Thanks, Scott

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31 Jul 2016 17:14 #30154

**Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

I think we're both thinking in the same direction - my idea of a "software" interconnecting box was not to replace, but to replicate the hardware one as an option - and each function would be optional, not just for each connector. Where hardware is not "opted in", the software counterpart operates. This is to keep the system scalable across self-contained FG setups (one PC), basic unspecialised breakout hardware (RPi/SDR widget) right up to a complex multi-unit hardware rig.

In the case of Mic/Tel, I'll need to figure out a solution that sticks with this, as irritatingly, it's easier to do the off-board approach than with, say, using nothing but my Windows PC. That bit needs a lot more thought, from the whole project's perspective, but chances are I will get an RPi and try the offboard solution first. The code for that will be a steep learning curve for me already, let alone dealing with Windows...

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01 Aug 2016 14:18 #30164

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Algernon wrote: I just remembered that ADF is something we don't collectively know much about

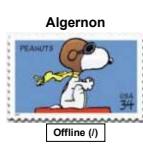
It just occurred to me where else I'd heard of ADF...

**Asian Dub Foundation-Keep Bangin On The Wall...**



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⌚ 01 Aug 2016 14:23 #30165

**Algernon replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Oh yeah, or course!

I'm getting a possible idea about ADF in the sense of radio, rather than feeding into the aircraft's navigation system as I was previously thinking - I'm reading Vulcan 607 to get data for my Black Buck scenario, and in that, they talk about using radio homing as a last resort when trying to find a tanker without air-to-air tacan.

In the last hour, I've completed the new codec and it's working at the controller side now. I'm now reorganising the code to work more efficiently, and then I'll reverse the procedure for the R/T unit.

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**ScottBouch**[Offline \(i\)](#)

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⌚ 01 Aug 2016 14:26 #30166

**ScottBouch replied the topic: Real PTR-175 and ARC-52 Control Unit Integration with FGFS**

Algernon wrote: I think we're both thinking in the same direction - my idea of a "software" interconnecting box was not to replace, but to replicate the hardware one as an option - and each function would be optional, not just for each connector. Where hardware is not "opted in", the software counterpart operates. This is to keep the system scalable across self-contained FG setups (one PC), basic unspecialised breakout hardware (RPi/SDR widget) right up to a complex multi-unit hardware rig.

Yes, I like the idea of making each function optional, that way it can be properly tailored to suit individual applications. Nice... Sorry if I'd misunderstood the concept, I saw it as being potentially limiting, but now see where you're coming from with it!

Algernon wrote: In the case of Mic/Tel, I'll need to figure out a solution that sticks with this, as irritatingly, it's easier to do the off-board approach than with, say, using nothing but my Windows PC. That bit needs a lot more thought, from the whole project's perspective, but chances are I will get an RPi and try the offboard solution first. The code for that will be a steep learning curve for me already, let alone dealing with Windows...

I have a Pi here I can start having a stab at, if you can give me a list of software to try installing and I'll let you know how it goes. I've never really messed with VOIP, but this would be a starting point, just to get some basic checks in place regarding software and repositories. we should start a new topic to cover sound, keeping this one to the controllers. I'll go off an do that now.

Thanks, Scott.

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**ScottBouch**