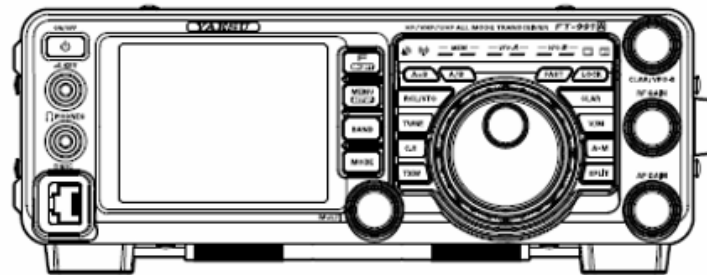


DIY PROJECT

FT-991A to CS520/W720 Plantronics Interface



Gene Hinkle, K5PA

12/9/2019

Also Check Out the CS520/W720 Resource Page

<https://cs520hams.k5pa.com>

Connectivity Between Radio to Headset

AC/DC 9 V Adapter RJ45 Audio Mini-USB Sound Card

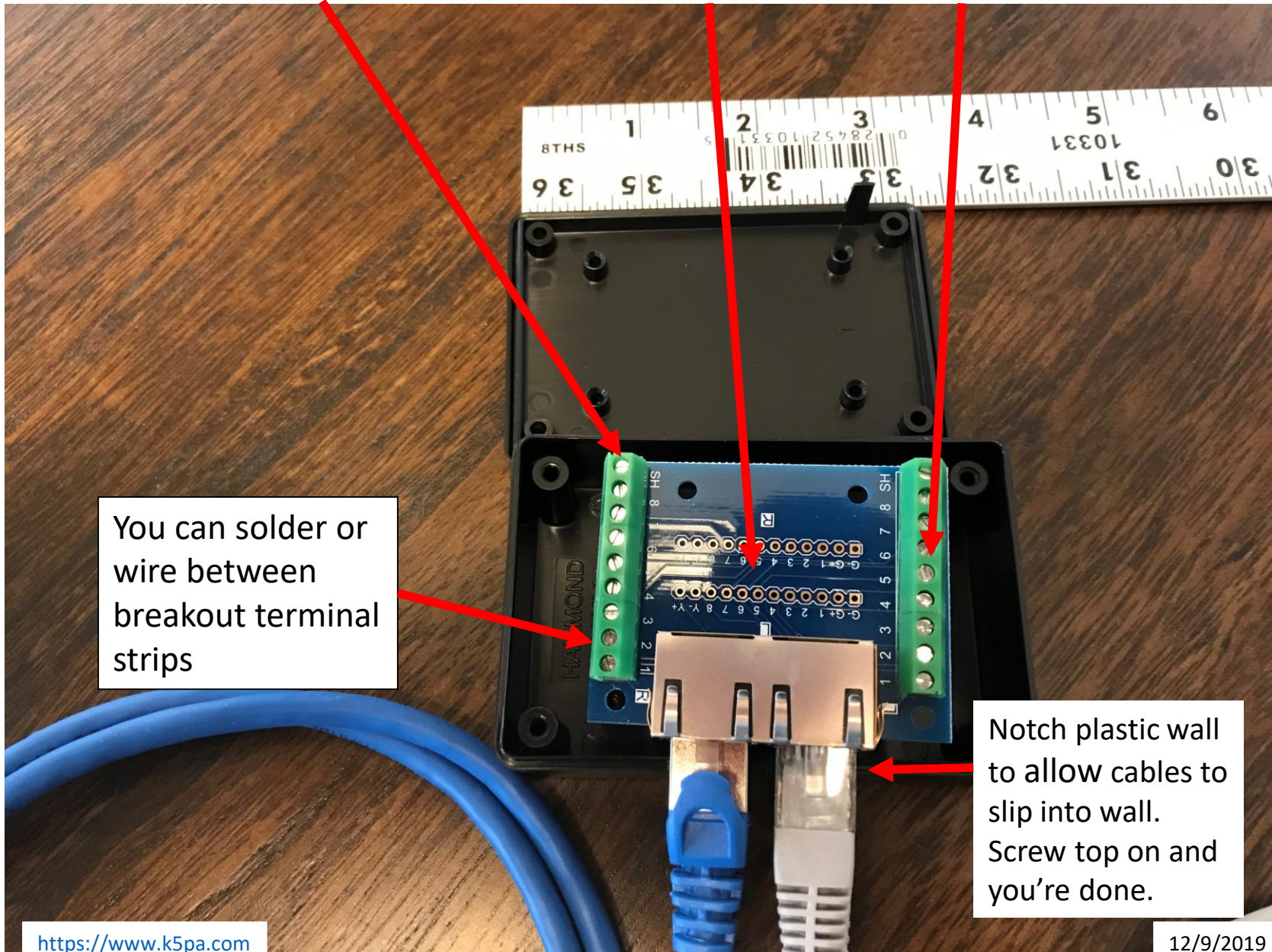


Dual RJ45 Breakout For Making Connections

RJ45 Breakout Terminals

Jumper Wiring Areas

RJ45 Breakout Terminals



You can solder or wire between breakout terminal strips

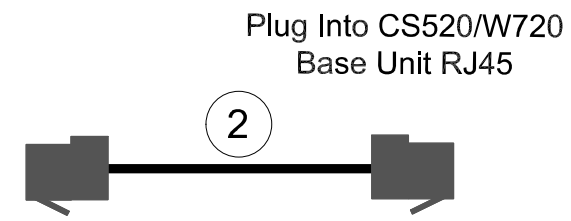
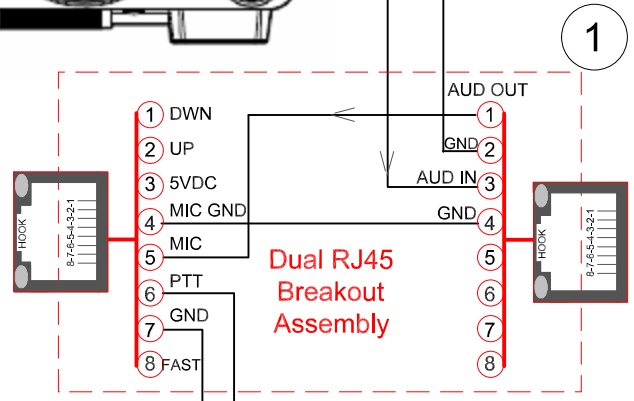
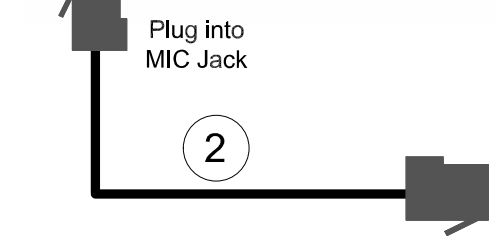
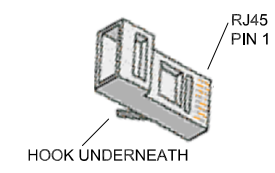
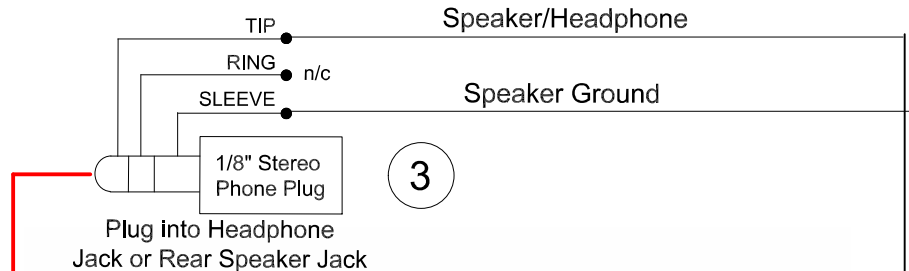
Notch plastic wall to allow cables to slip into wall. Screw top on and you're done.

Typical Box to Use as Enclosure. Easy to Cut Plastic. Inexpensive.
Source: Mouser Electronics listed in the Bill of Materials List.

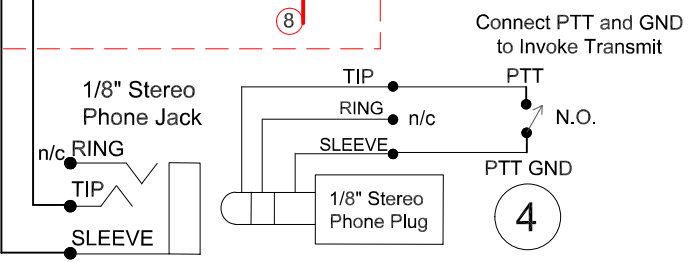
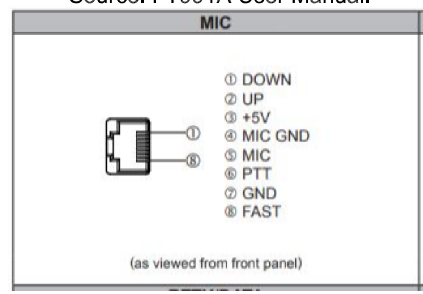


Interface Using Switch for Radio PTT

CHANGE HISTORY		
VERSION	DATE	DESCRIPTION
A	12/4/2019	Initial release



Front Panel View Mic Connections
Source: FT991A User Manual.



Note: 1/8" Plug/Jack is same as 3.5 mm

Notice: There is no implied warranty that the information present is free from error and the user of this information should validate it's accuracy and usage in their intended applications.

1	1	REFER TO BILL OF MATERIALS (BOM) ATTACHED
ITEM	QTY	DESCRIPTION
K5PA DESIGN CONCEPTS TITLE YAESU FT-991A CABLE TO PLANTRONICS CS520 / W720		
gh	A2	4000-0055
12/4/2019	SCALE	SHEET 1 of 1

Date: 12/4/2019

Bill of Materials Drawing 4000-0055 Rev A**Yaesu FT-991A or FT-857D to Plantronics with Spring Return Toggle Switch P**

Item	Part No.	Part Description	Mfgr	Part No.	Vendor	URL of Vendor P/N	Qty
1	4000-0055	Dual RJ45 Ethernet Connector Breakout Board w/ LED Screw terminals	MFDFLY	Breakout0028	Amazon	Breakout0028	1
2	4000-0055	C2G/Cables to Go 28690 Cat5E Molded Shielded (STP) Network Patch Cable, Black (3 Feet/0.91 Meters) (OR EQUIVALENT)	C2G/Cables to Go	28690	Amazon	28690	2
3	4000-0055	Hosa MHE-110 3.5 mm TRS to 3.5 mm TRS Headphone Extension Cable, 10 feet (Note: Cut in Half to Create Each End Type Required) (OR EQUIVALENT)	HOSA	MHE-110	Amazon	MHE-110	2
4	4000-0055	Cylewet 12Pcs 1A 250V AC 2 Pins SPST Momentary Mini Push Button Switch Normal Open (Pack of 12) CYT1078 (OR EQUIVALENT)	Cylewet	CYT1078	Amazon	CYT1078	1
5	4000-0055	Project Box, Plastic Enclosure, Black, 3.3 x 2.2 x 0.8 inches	Hammond Mfgr	1591XXMSBK	Mouser Electronics	Go to Mouser Electronics Website (www.mouser.com) and search on their part number: 546-1591XXMSBK	1

CHANGE HISTORY		
VERSION	DATE	DESCRIPTION
A	12/4/2019	Initial release

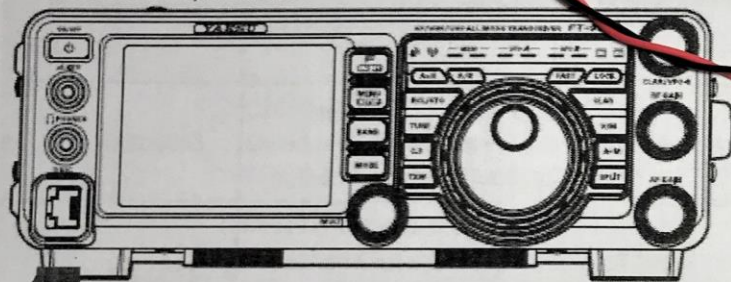
PTT Switch
Spring Return
Normally Open (N.O.) Contacts

Mic Audio
Red=Mic
Blk=GND

Speaker Audio
Tip=White (Spkr)
Ring=Red (n/c)
Sleeve=Shield

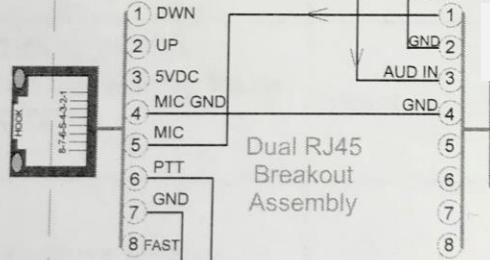
RJ45 to Radio

RJ45 to W720



Plug into MIC Jack

Plug Into CS52/W720 Base Unit RJ45



Note: 1/8" Plug is same as 3.5 mm

Notice: There is no implied warranty... the user of this information should validate it's accuracy... applications.

DESCRIPTION			
K5PA DESIGN CONCEPTS			
TITLE YAESU FT-991A CABLE TO PLANTRONICS CS520 / W720			
SIZE A2	CASE CODE	ISSUE NO. 55	REV A
SCALE	DATE 12/4/2019	PRICE 1 of 1	

Interface Using Wireless Relay for Radio PTT

- Bench test unit is shown on next page with circuit card and remote control FOB

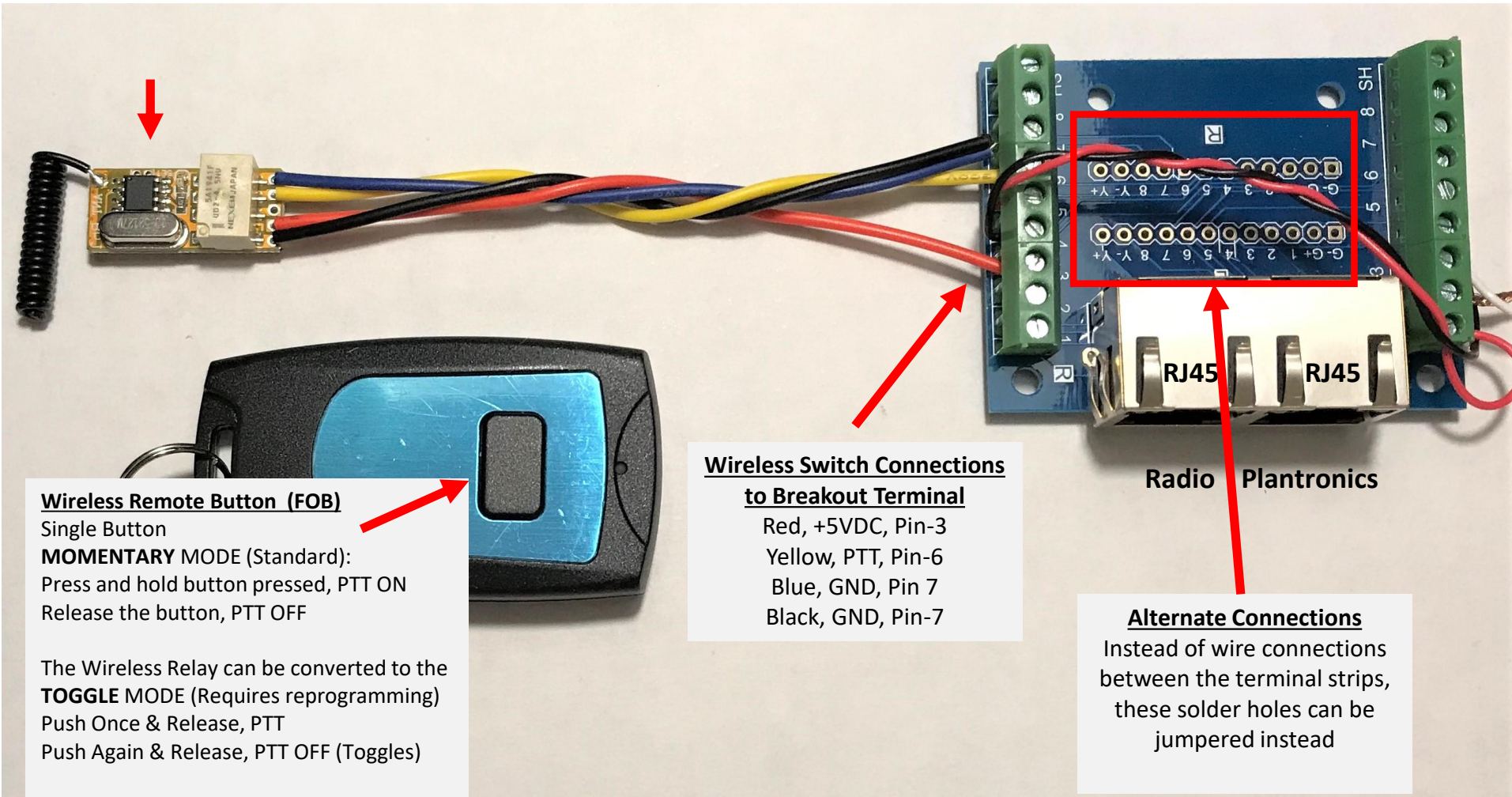
Bench Test Unit

Wireless Relay

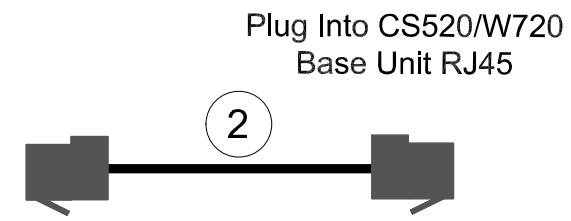
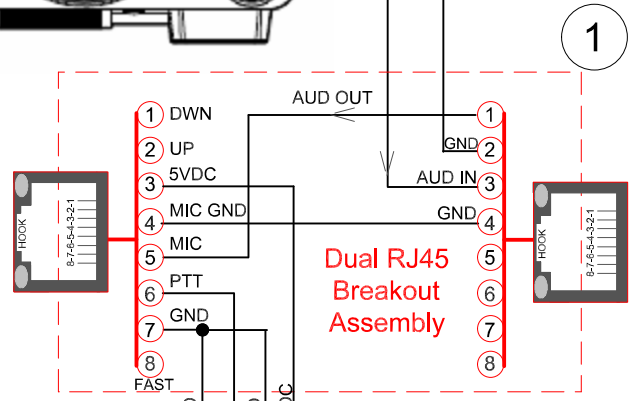
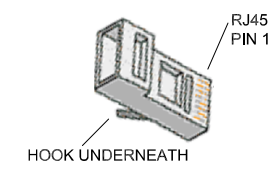
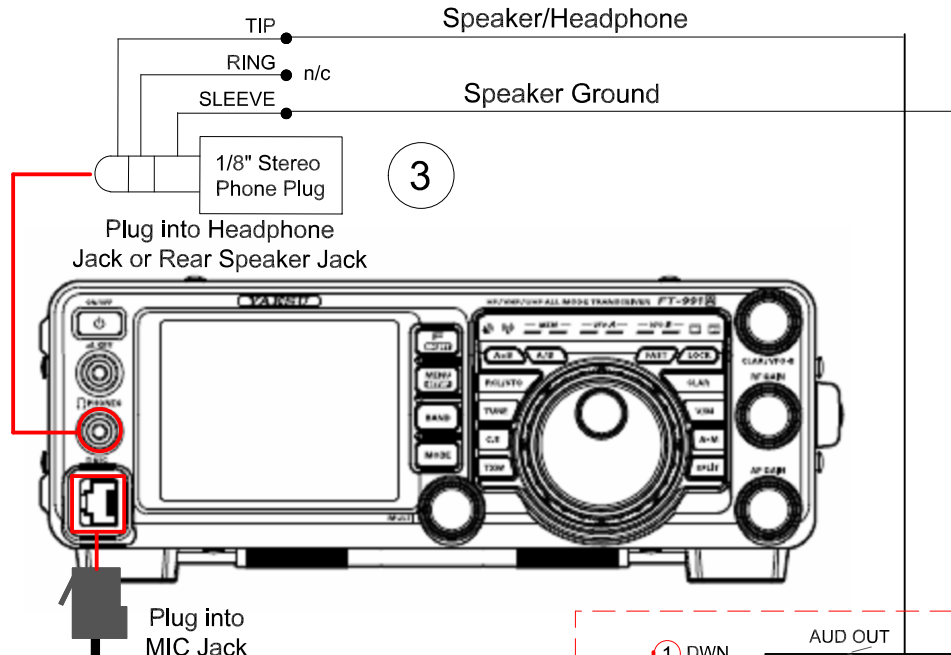
Wireless Remote Control Relay Switch, 433MHz 12V, Waterproof Transmitter Momentary Switch RF Relay (1 Transmitter & 1 Receiver) DC3.7V 4.5V 5V 6V 7.4V 9V 12V

Relay Output Contacts: C, NO, NC. Relay verified to operate at 3.5 VDC on bench test.

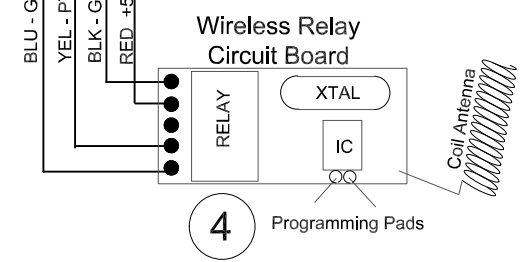
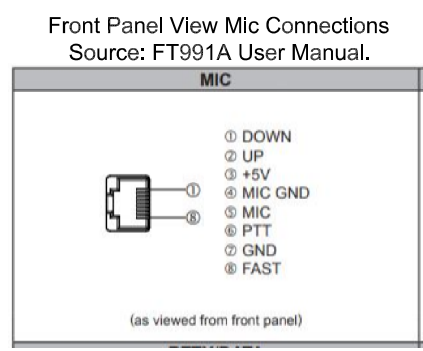
URL: https://www.amazon.com/gp/product/B07F9QN2QQ/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1



CHANGE HISTORY		
VERSION	DATE	DESCRIPTION
-	12/8/2019	Initial release



Connect PTT and GND to Invoke Transmit



1	1	REFER TO BILL OF MATERIALS (BOM) ATTACHED
ITEM	QTY	DESCRIPTION
K5PA DESIGN CONCEPTS TITLE YAESU FT-991A or FT-857D CABLE TO PLANTRONICS CS520 / W720 WITH WIRELESS PTT		
gh	A2	4000-0056
12/8/2019	SCALE	SHEET 1 of 1

Notice: There is no implied warranty that the information present is free from error and the user of this information should validate its accuracy and usage in their intended applications.

Date: 12/8/2019

Bill of Materials Drawing 4000-0056 Rev -

Yaesu FT-991A or FT-857D to Plantronics with Wireless PTT

Item	Part No.	Part Description	Mfgr	Part No.	Vendor	URL of Vendor P/N	Qty
1	4000-0056	Dual RJ45 Ethernet Connector Breakout Board w/ LED Screw terminals	MFDFLY	Breakout0028	Amazon	Breakout0028	1
2	4000-0056	C2G/Cables to Go 28690 Cat5E Molded Shielded (STP) Network Patch Cable, Black (3 Feet/0.91 Meters) (OR EQUIVALENT)	C2G/Cables to Go	28690	Amazon	28690	2
3	4000-0056	Hosa MHE-110 3.5 mm TRS to 3.5 mm TRS Headphone Extension Cable, 10 feet (Note: Cut in Half to Create End Type Required) (OR EQUIVALENT)	HOSA	MHE-110	Amazon	MHE-110	1
4	4000-0056	Wireless Remote Control Relay Switch, 433MHZ 12V, Waterproof Transmitter Momentary Switch RF Relay (1 Transmitter & 1 Receiver) DC3.7V 4.5V 5V 6V 7.4V 9V 12V	Fu Shi	ASIN: B07F9QN2QQ	Amazon	Wireless Relay	1
5	4000-0056	Project Box, Plastic Enclosure, Black, 3.3 x 2.2 x 0.8 inches	Hammond Mfgr	1591XXMSBK	Mouser Electronics	Go to Mouser Electronics Website (www.mouser.com) and search on their part number: 546-1591XXMSBK	1

As-Built Photos of First Article

P/N 4000-0056 Rev-

Construction & Photo Credits, Chris, KE8INO

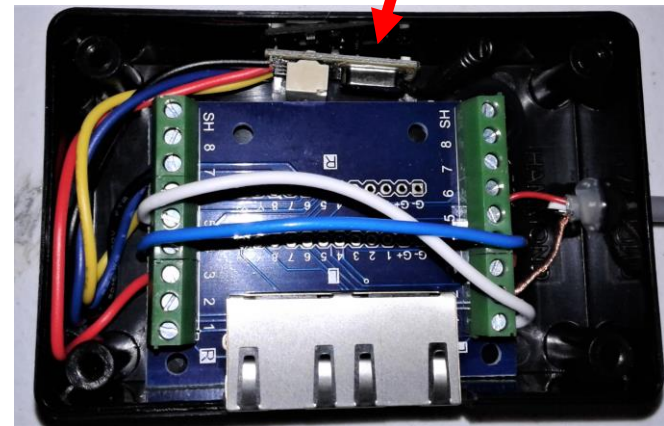
1/8" TRS Plug, FT-990A
Headphone/Speaker Output



RJ45 to FT-991A Mic

RJ45 to W720 Base Unit

Wireless Relay PTT
Circuit Board



DIY Project Completion

- Connect the wiring on the dual RJ45 breakout board
- Cut the RJ45 access slots for the 2 connectors
- Drop the breakout board into the box, add either wireless PTT or spring release switch PTT
- Plug the RJ45 into the radio and the CS520 or W720 base unit
- DIY Project is Complete!

- If you want to reprogram the wireless switch, read on

How to Program the Remote Relay

Wireless Relay “LEARNING DOTS”

Learning Dots are Solder Pads Used to Program Device



Solder Pads are Called LEARNING DOTS in Instructions

Momentary short together SET solder pads to program different functions

Instruction Manual

Receiver :

Working Voltage: DC3.5V-DC12V

Max Load: 1A (have better Load less than 700ma)

Quiescent Current: 5ma

Relay Working Current: 20-30ma

Size: 25*11*8mm

How to change working mode : (need Soldering Station)

Low wattage solder iron needed

Momentary : Connect the right side 2 points (M) **Bridge resistor (10) right side M**

Latched : Connect the left side 2 points (L) **Bridge resistor (10) left side L**

Toggle : Let Point L and Point M in non-occupation **Remove resistor (10) from L and M**

Definition of Modes

Momentary-----press one button is working /ON. loosen your finger on the same button is stop/OFF

Toggle-----press one button for one time is working/ON .press the same button again is stop/OFF .

Latched-----press button A is working/ON ,press button B is stop/OFF .

Learning method : **How to Program the Modes**

Latched: **Set to Latching Mode**

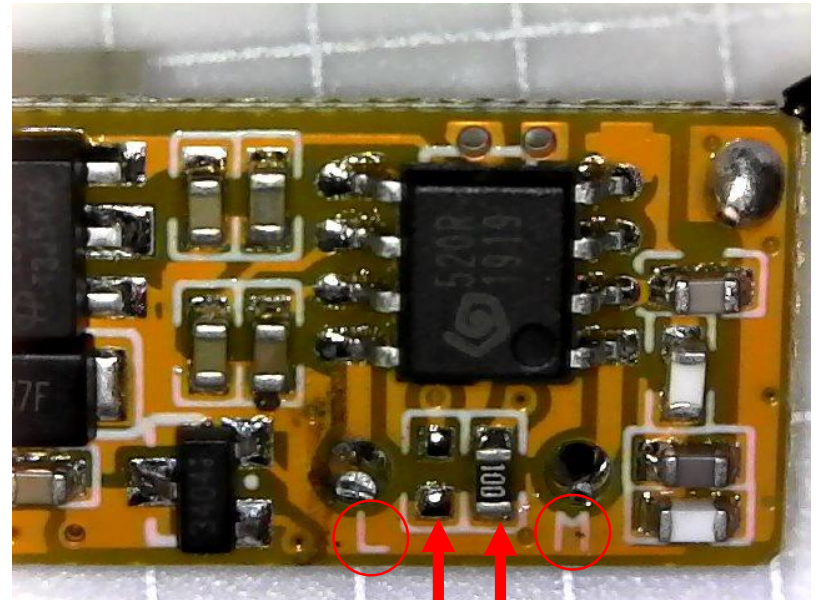
Input 3.5V-12V for the Receiver , Connect the Learning Dot, The receiver Led indicator ON. Press remote button A 1 time, Led indicator flash for 3 times , Then Press remote button B 1 time , Led indicator flash for 3 times again , it mean learning successfully.

Momentary / Toggle : **Set to Momentary/Toggle Mode**

Input 3.5V-12V for the Receiver , Connect the Learning Dot, The receiver Led indicator ON. Press remote button A 1 time, Led indicator flash for 3 times , Then Press remote button A 1 time again , Led indicator flash for 3 times again , it mean learning successfully.

Clearing method : **Clear ALL Modes**

Connect the Learning Dot 5 seconds . Until the receiver Led indicator From ON to OFF, it mean Clearing Code.



L = Latch or M=Momentary

Move 10 ohm resistor to L, M or remove completely
In photo, M is bridged by 10 ohm resistor
10 ohm is signified by 100 on surface mount component

Solder Pads are Called LEARNING DOTS in Instructions
Momentary Short Together To Program Different Functions