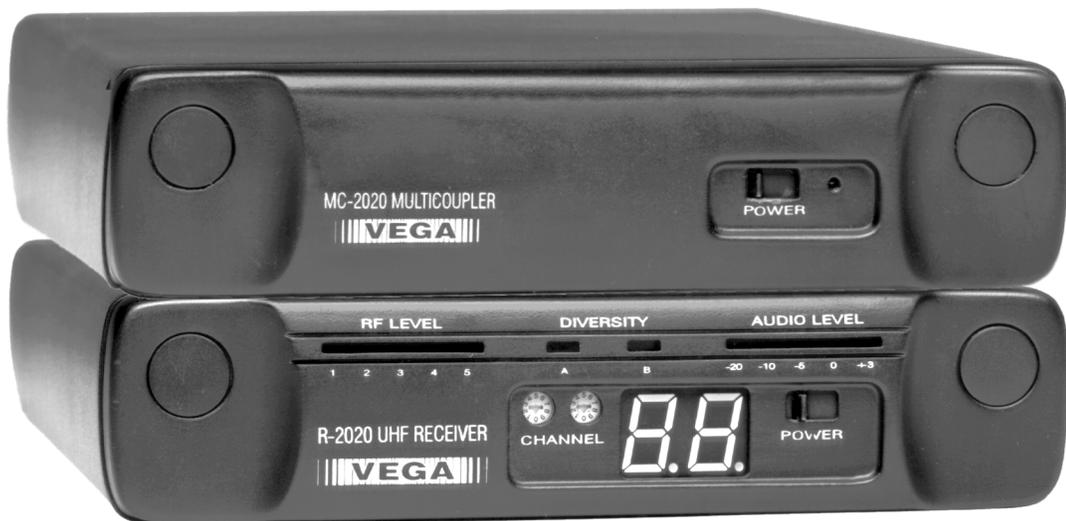


U2020 Application Guide



This guide provides information for configuring U2020 systems with various numbers of channels. Block diagrams and basic equipment lists are provided for systems with from four to sixteen channels. Other useful application and configuration information is also included.

Important Notes

1. Each MC-2020 series multicoupler can power to up to four attached receivers through its BNC antenna cables. The MC-2020 power supply has a capacity of 2.5 amperes, more than enough for four receivers and the multicoupler itself. **It is NOT necessary to use the wall-type power supplies for the receivers** when they are connected to the output of a MC-2020 multicoupler. This usually considerably simplifies the installation of a U2020 system.

WARNING

Because dc power is present at the output connectors of the MC-2020, **unused outputs SHOULD NOT be terminated with 50 ohms**. For the same reason, MC-2020 series multicouplers SHOULD NOT be used with receivers other than the R-2020. Serious damage to the receiver, and in some cases to the multicoupler, can result.

2. The original MC-2020 multicoupler covered the 746 -782 MHz frequency range used by the "A" and "B" versions of the U2020 system. The newer MC-2020A multicoupler covers the full 672 to 782 MHz frequency range, making it compatible with the newer "C", "D", "E" and "F" frequency ranges for the U2020, as well as with the original "A" and "B" ranges. If a U2020 installation includes ANY systems in the newer "C", "D", "E" and "F" frequency ranges, the MC-2020A multicoupler MUST be used, and not the original MC-2020.
3. Early MC-2020 multicouplers used 2.5 mm power connectors, the same size as for the R-2020 receiver. In some instances, users attempted to power MC-2020s and the attached R-2020s from one of the small wall-type power supplies. This resulted in system failure and overheating of the power supply. Recently produced MC-2020s and all MC-2020As use a 2.1 mm power connector, preventing this problem.

If a replacement power supply is required for a MC-2020; please specify the connector size when ordering. (If the plug on a wall-type power supply fits the power connector on the MC-2020, a replacement with the 2.5 mm connector is required. If it does not fit, a 2.1 mm power connector is needed.)

Application Tips

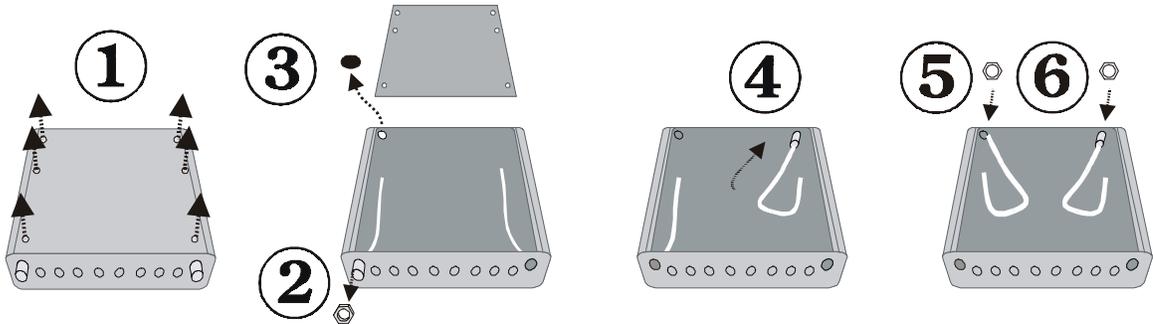
The MC-2020 and MC-2020A are supplied with eight 24" (60 cm) BNC RF cables for connecting the multicoupler output to four R-2020 receivers. Unless remote antennas will be used, no additional RF cables will be required.

The MC-2020 and MC-2020A are not supplied with antennas. Generally, installations that use multicouplers will require remote antennas. If the use of whip antennas is acceptable, the whips supplied with one of the R-2020s can be used. Note that the antennas can be converted from right-angle to straight whips by loosening the hex set screw on the side of the antenna body, removing the antenna element, reinserting it into the hole on the end of the body, then retightening the set screw.

The R-2020 receiver and MC-2020 series multicouplers include a feature that allows the antennas to be mounted on either the front or the rear of the unit. These units are normally shipped with the connectors on the rear panel. If relocation to the front panel is desired (to permit use of the supplied whip antennas when the equipment is rack mounted, for example), proceed as follows.

To move antennas to the front of the multicoupler

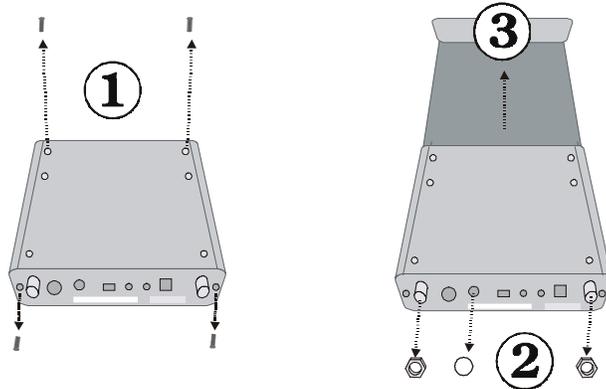
1. Remove the screws attaching the bottom cover of the unit and detach the cover.



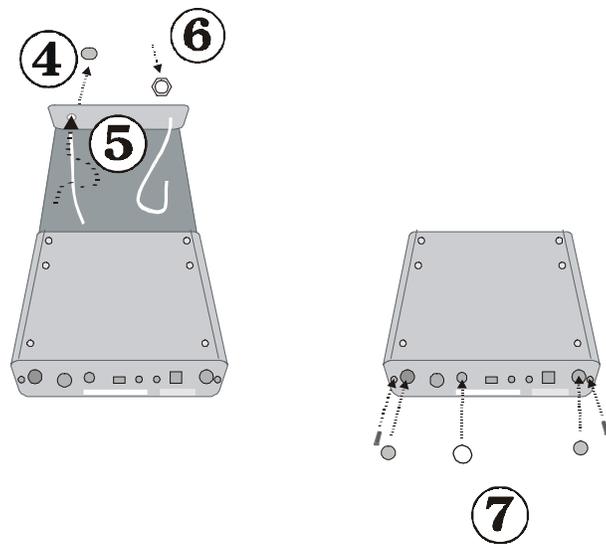
2. With a 5/8" (16 mm) socket wrench, remove the hex nuts attaching the connector to the multicoupler rear panel.
3. Gently push out the round plastic cover hole covers on the front panel of the unit.
4. Remove the antenna connectors from the rear panel of the unit and install them in the front panel of the unit. Make certain that the internal antenna cables do not lie down directly on the multicoupler circuitry, as this will affect performance.
5. Reinstall the connector hex nut and lockwasher, then gently tighten the nut. Do not use excessive force, as this can crack the panel of the unit.
6. Repeat for the other connector.
7. Push round plastic cover hole covers into the hole where the antennas were before and reinstall the bottom cover of the unit.

To move antennas to the front of the receiver

1. Using a Phillips-head screwdriver, remove the two bottom screws (bottom panel closest to the front of the receiver) and the two screws on the rear panel as shown below.
2. Using a 5/8" (16 mm) socket wrench, unscrew the antenna hex nuts. Then using a small pair of pliers, gently unscrew the round serrated audio-output connector nut.
3. Gently slide the PCB out.

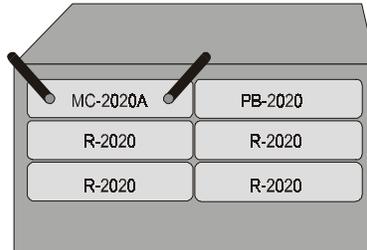


4. Pop out the antenna plugs in the front of the receiver.
5. Carefully move the antenna connectors to the front panel and insert the connectors through the holes. Make certain that the internal antenna cables do not lie down directly on the receiver circuitry, as this will affect performance.
6. Screw the hex nuts and lock washers back on (being careful not to use excessive force) and slide the PCB back into the case. Then reattach the two bottom screws.
7. Pop the plugs into the antenna holes in the rear panel and reattach the audio-output nut and small screws to the rear panel.



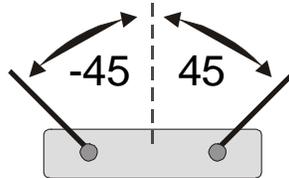
Rack Mounting Kit

A dual rack mounting kit for the R-2020, MC-2020 and MC-2020A, model RK-2020, is available. Complete instructions for mounting receivers and multicouplers are included with the RK-2020. Note that there will be an unfilled hole remaining when an odd number of receivers and multicouplers are mounted. A decorative blank filler panel, the PB-2020, is available for use in this situation.



Antenna Orientation

When using whip antennas, best performance is usually obtained when the antennas are arranged in a “V” orientation. In this configuration one antenna will be approximately 45 degrees clockwise from vertical, and the other approximately 45 degrees counterclockwise from vertical.



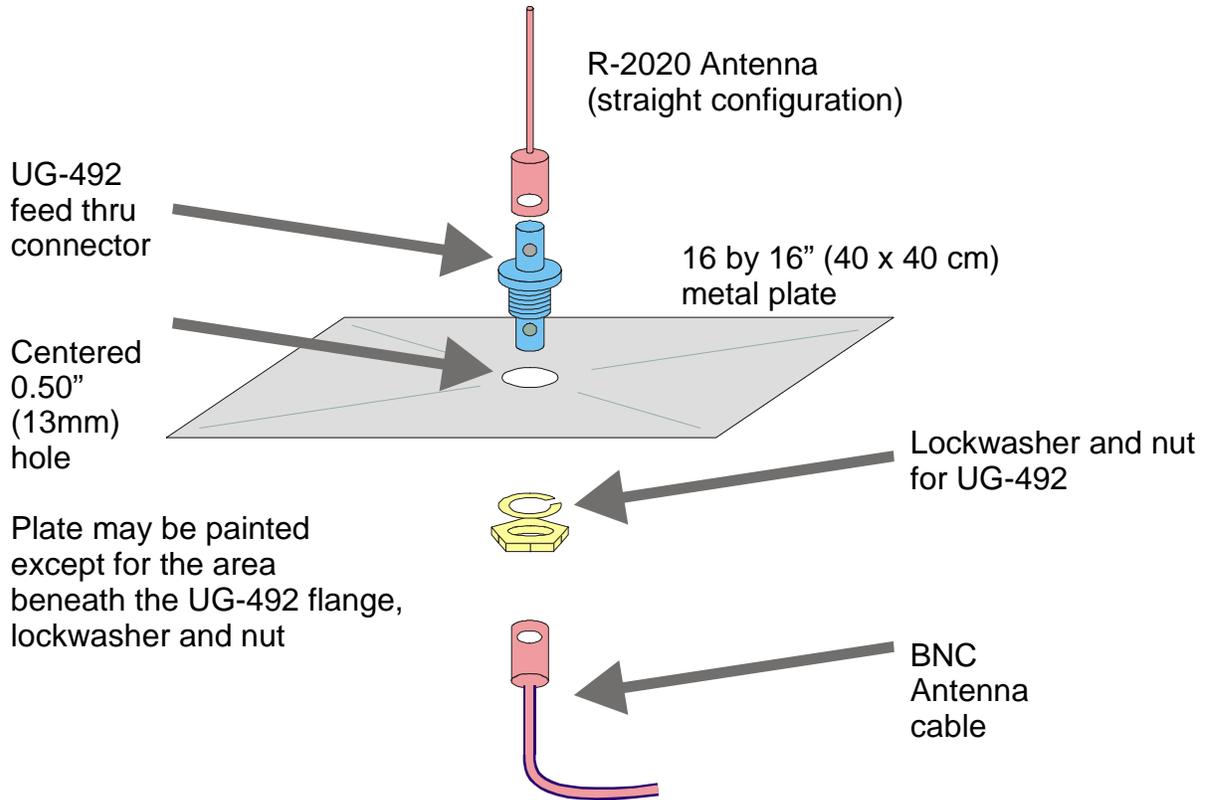
Remote Antennas

Using directly-attached whip antennas for rack mounted U2020 systems can create a number of performance problems, including poor range and unnecessary interference. This is especially likely when metal cabinets are used or when a considerable amount of equipment is being rack mounted.

At the very minimum, the antennas should be relocated to the front panel of the receivers or multicoupler (see instructions on pages 3 and 4) and the rack turned so that the front of rack faces the area where the wireless transmitter will be used. When using multiple receivers, the antennas should never be allowed to touch each other.



In most cases, remote antennas are preferable when U2020 systems are rack mounted. Vega offers several appropriate UHF antennas, including the AN-722, AN-723 and AN-725. The whip antennas supplied with the receivers can also be used remotely, PROVIDED that an appropriate ground plane is provided. See the illustration below. Consult the Vega factory for recommendations for other suitable ground plane configurations.



NOTICE:

Simply connecting a whip antenna to the end of a coaxial cable results in an extremely inefficient antenna which will almost always greatly reduce the usable range of the wireless systems. Do not use this arrangement.

Using Remote Antennas

Vega's AN-700 series antennas are provided with 10 to 15 foot (3 to 4.5 M) RF cables. In situations where longer cables are necessary, extension cables can be used. However, there are a considerable number of technical considerations involved, particularly when cable lengths over about 30 feet (10 M) are needed. Discussion of all of the various issues involved in this situation are well beyond the scope to this guide. Consult the Vega factory for additional information. A wireless applications guide, which includes an extensive discussion regarding antennas and antenna cables, is available from Vega. Users of Vega wireless systems can obtain a copy of this document by contacting Technical Support at the Vega factory.

U2020 System Block Diagrams and Equipment Lists

This information may be helpful to you when planning various size systems. Call Vega for larger system diagrams. Please feel free to duplicate as required.

Four-Up Systems consist of:

- 4 U2020 Systems of choice
- 1 MC-2020 Multicoupler
- 3 RK-2020 Rack Kits
- 1 PB-2020 Blank Panel
- 2 AN-700 Series antennas of choice

Six-Up Systems consist of:

- 6 U2020 Systems of choice
- 2 MC-2020 Multicoupler
- 4 RK-2020 Rack Kits
- 2 AN-700 Series antennas of choice

Eight-Up Systems consist of:

- 8 U2020 Systems of choice
- 3 MC-2020 Multicoupler
- 6 RK-2020 Rack Kits
- 1 PB-2020 Blank Panel
- 2 AN-700 Series antennas of choice

Ten-Up Systems consist of:

- 10 U2020 Systems of choice
- 3 MC-2020 Multicoupler
- 7 RK-2020 Rack Kits
- 1 PB-2020 Blank Panel
- 2 AN-700 Series antennas of choice

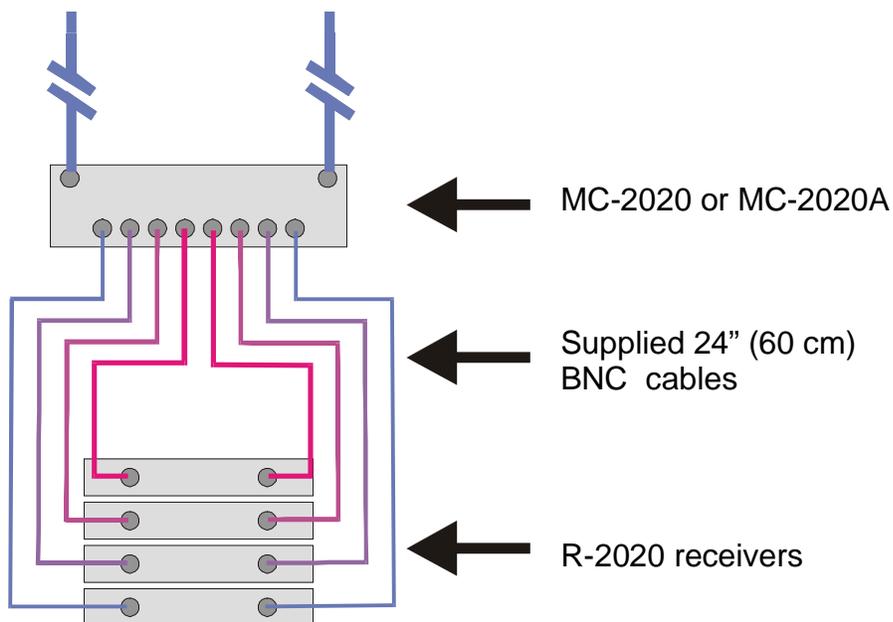
Twelve-Up Systems consist of:

- 12 U2020 Systems of choice
- 4 MC-2020 Multicoupler
- 8 RK-2020 Rack Kits
- 2 AN-700 Series antennas of choice

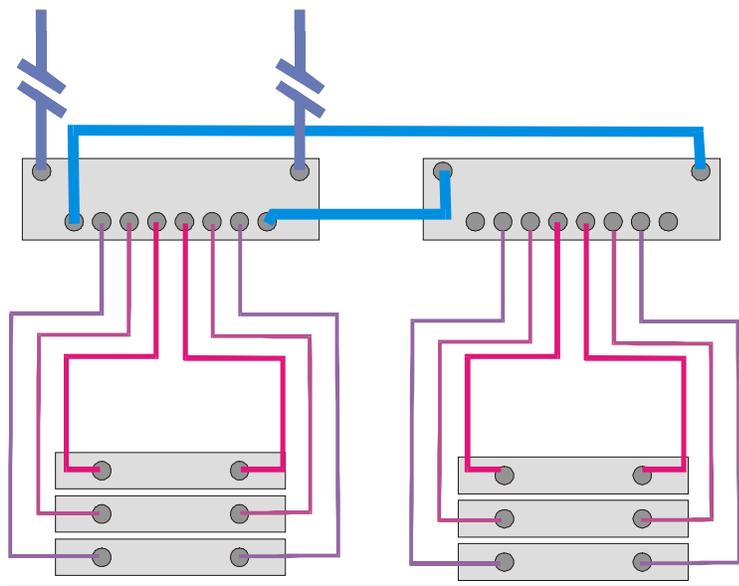
Sixteen-Up Systems consist of:

- 16 U2020 Systems of choice
- 5 MC-2020 Multicoupler
- 11 RK-2020 Rack Kits
- 1 PB-2020 Blank Panel
- 2 AN-700 Series antennas of choice

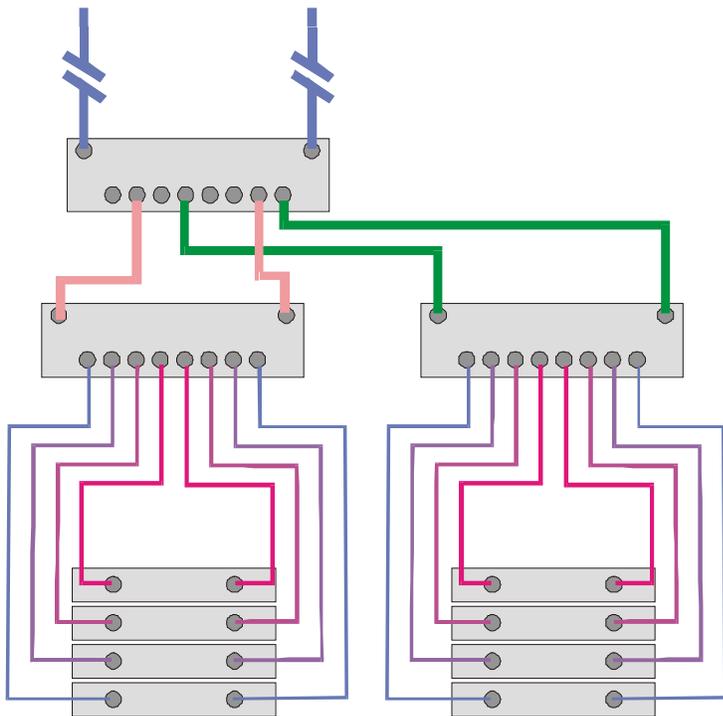
Four-Up Systems consist of:



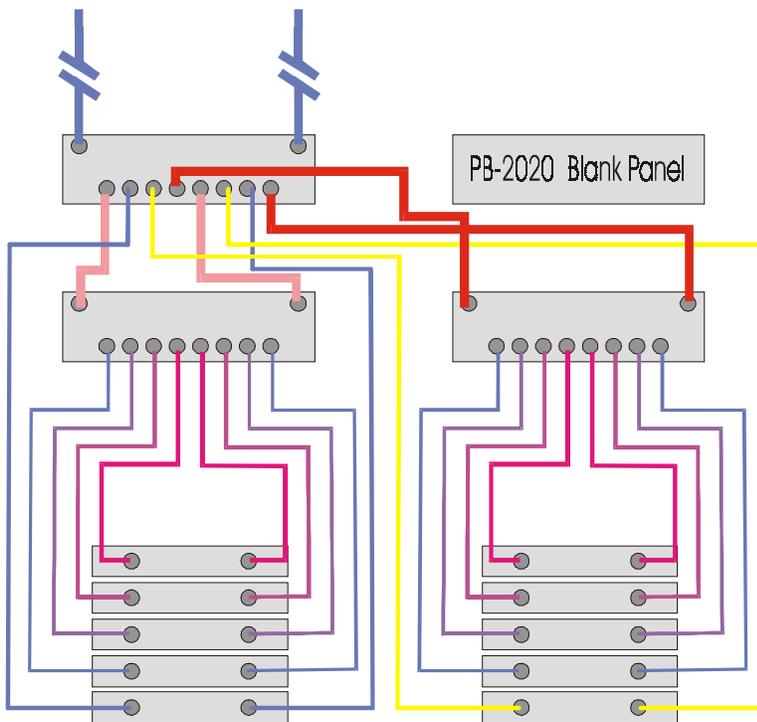
Six-Up Systems consist of:



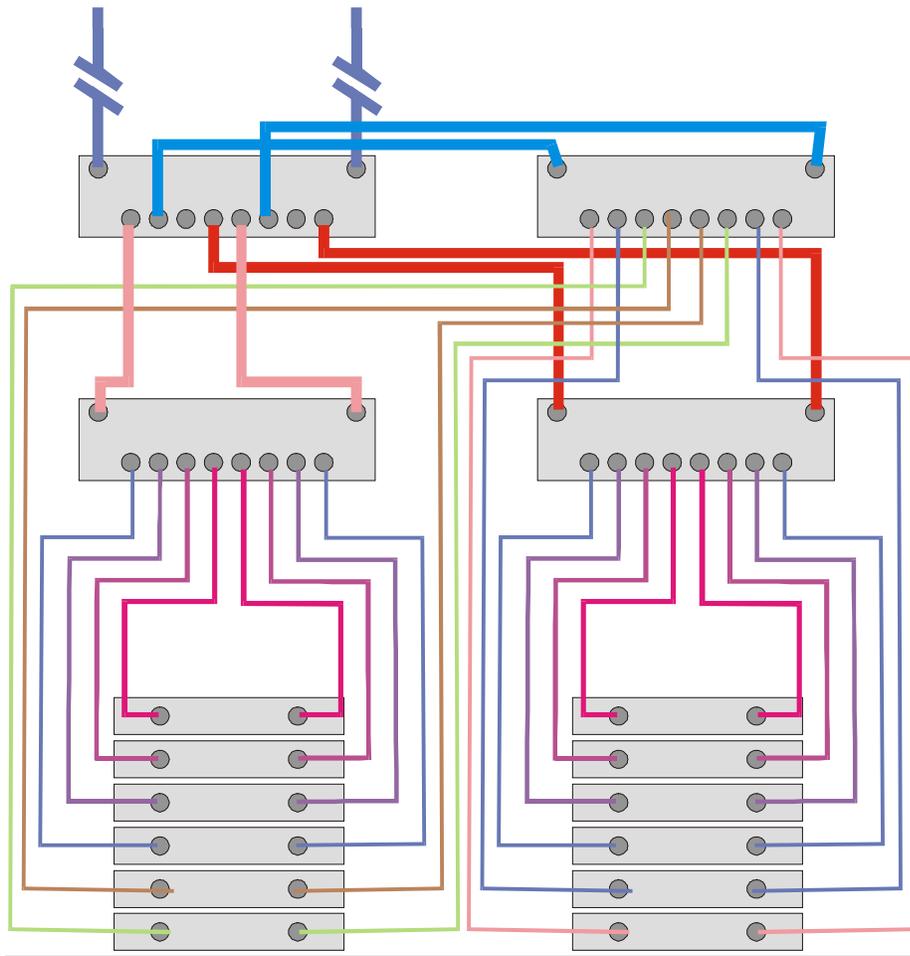
Eight-Up Systems consist of:



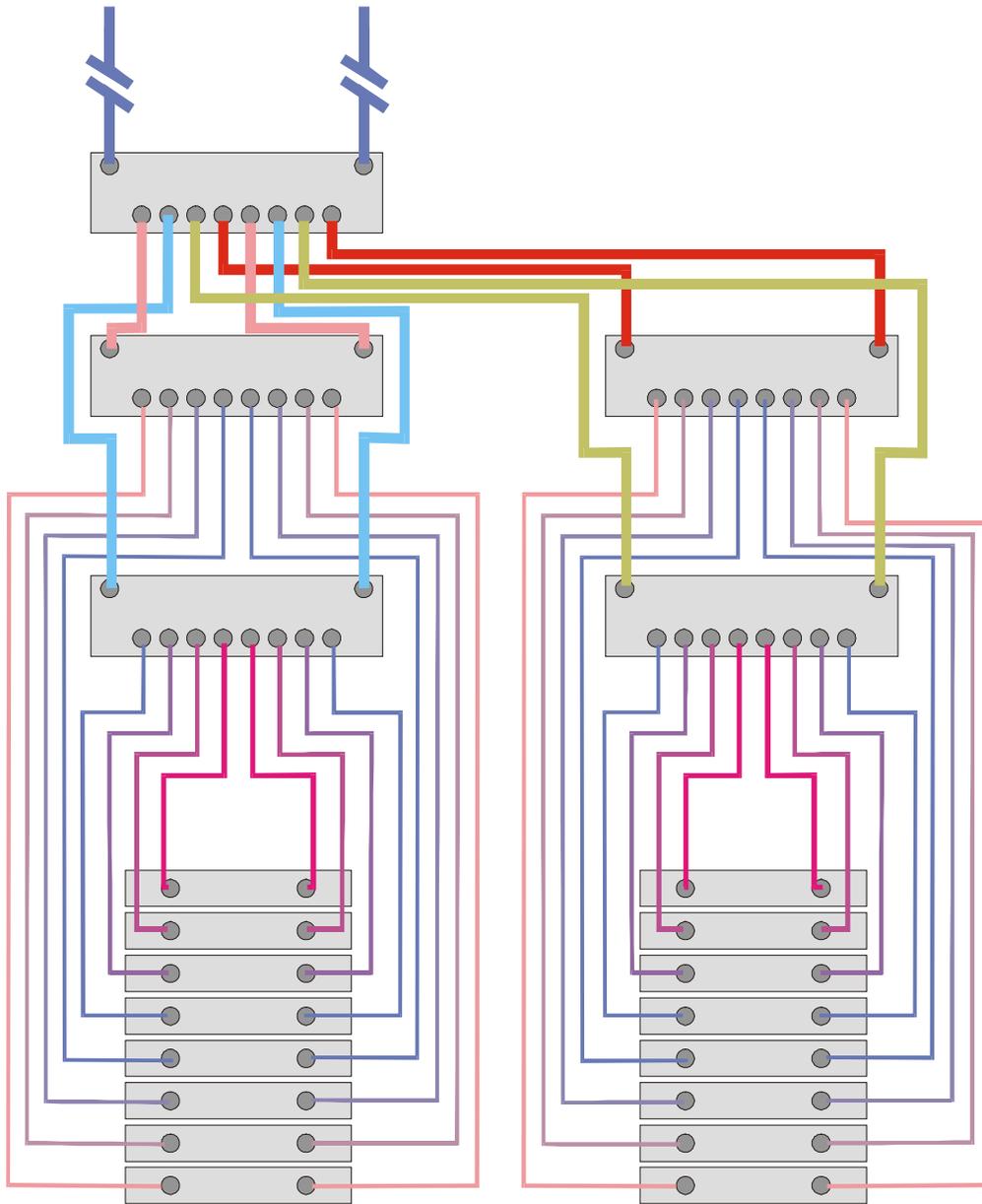
Ten-Up Systems consist of:



Twelve-Up Systems consist of:

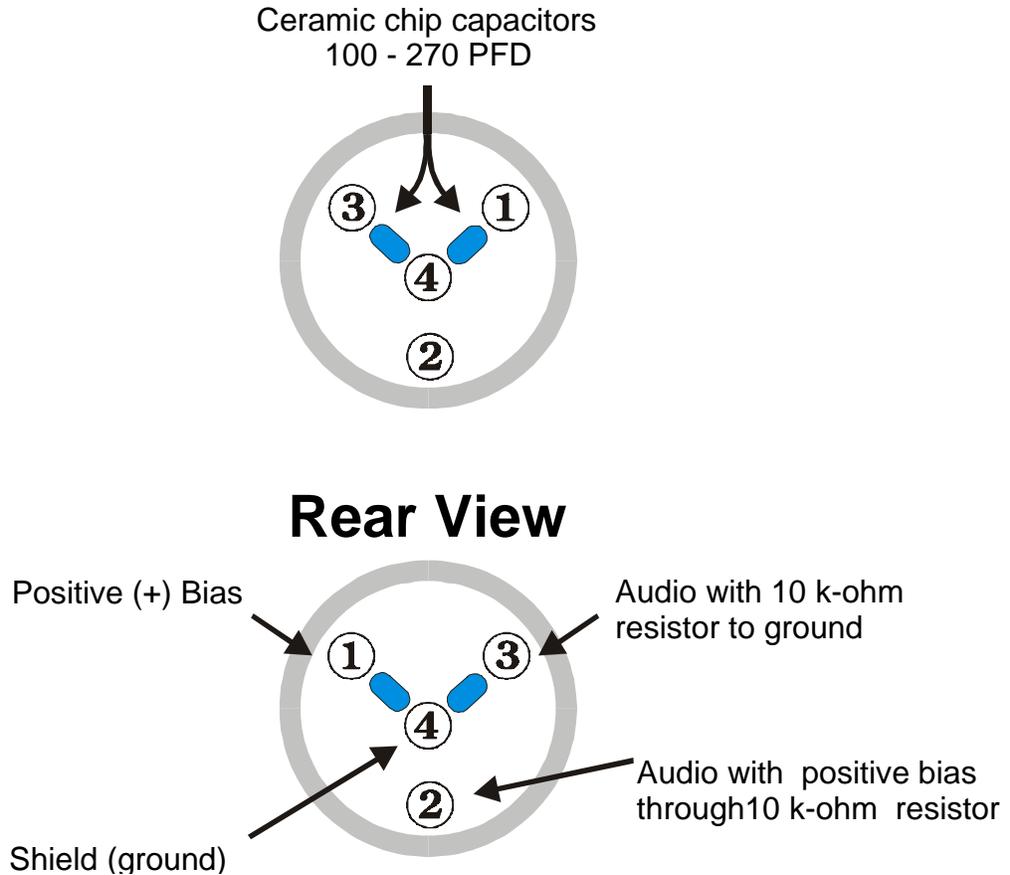


Sixteen-Up Systems consist of:



BT-2020 Lavalier Microphone Connections

Many different manufacturer's microphones may be connected to BT-2020s. Use the following information as a guide only.



Vega

9900 East Baldwin Place • El Monte, California 91731-2294
Phone: 626-442-0782 • Toll-Free: 800-877-1771 • Fax: 626-444-1342
FaxBack: 626-444-2017 • Toll-Free FaxBack: 800-274-2017
www.vegawireless.com

Vega Microphone Connection Data: Miniature XLR (TINI "Q-G")

(For Vega Models: T-16, T-17, T-25, T-37, Ranger Transmitters, and BT-2020)

Manufacturer	Model	Vega Model #	Pin #1	Pin #2	Pin #3	Pin #4	Notes
AKG	C67, C567	—	Shield	—	White	—	2
Audio Technica	AT803, 831	—	Red/Wh	—	Yel/Bk	Shield	1, 2
Audio Technica	ATM71	HM-177X	Red	—	Yellow	Shield	2
Beyer	MCE5.9	—	Inner Sh.	—	Green	Shield	2
Beyer	MCE10	—	Inner Sh.	—	Green	Shield	2
Crown	GLM-100/E	LM-202X	Red	—	White	Shield	
Countryman	Various	—	Red	—	White	Shield	4
Electro-Voice	CO-90	—	White	—	Red	Shield	
Electro-Voice	CO-100	LM-208X	White	—	Red	Shield	2
Electro-Voice	CS-200	LM-209X	White	—	Red	Shield	2
Electro-Voice	CO2	CO2EX	Pink	—	White	Shield	2
PSC	Millimic	—	—	Red	—	Shield	
Sanken	COS-11	—	Black	—	White	Shield	2
Sennheiser	MKE 2	LM-204X	Red	—	White	Shield	2, 7, 8
Sennheiser	40	—	Red	—	White	Shield	2, 7, 8
Shure	838	113X	Red	—	Black	Shield	2, 4
Shure	SM83	—	Red	—	Black	Shield	2, 4
Shure	SM84	—	Red	—	Black	Shield	4
Sonotrim	Various	—	—	White	—	Shield	10
Sony	ECM-44_PT	LM-201X	Red	—	White	Shield	2, 6
Sony	ECM-50_PS	—	Red	—	White	Shield	2
Sony	ECM-55_PT	—	Red	—	White	Shield	2, 6
Sony	ECM-66_PT	—	Red	—	White	Shield	2, 6
Sony	ECM-77_PT	—	Red	—	White	Shield	2, 6
Tram	TR-50 (Neg)	—	Shield	—	White	—	1
Tram	TR-50 PS	—	—	White	—	Shield	1
Vega	RSX-7	LM-210X	Red	—	White	Shield	2
Vega	RSX-11	LM-206X	—	Red	—	Shield	2
Vega	RSX-12	LM-203X	Red/Wh	—	Yel/Bk	Shield	1, 2
General	Pos 2 wire	—	—	Audio	—	Shield	
General	Pos 3 wire	—	+ Bias	—	Audio	Shield	
General	Neg 2 wire	—	Shield	—	Audio	—	
General	Neg 3 wire	—	Shield	Audio	—	- Bias	
General	Hi Output Dynamic	—	—	—	Wire #1	Wire #2/ Shield	3, 5
Pin Function	—	—	+ Bias (6-9 v)	+ Bias thru 10 kW	10 kW to Ground (Audio)	Ground	

Notes

5)

- 1) Manufacturer not consistent with wire color code assignments and biasing arrangements. Some units may have different colors and may require other bias connections.
- 2) These microphones are frequently RF sensitive. A small monolithic bypass chip capacitor (220 to 560 pF) may be required from the signal lead to ground, or from the bias lead to ground, or both.
- 3) These transmitters are optimized for use with lavalier electret microphones. Low output dynamic microphones may not drive the transmitter fully.
- 4) Some microphones require an electronic equalizing circuit for proper response. They will operate properly but may not sound exactly like the wired version.
- 5) A Vega 114X adapter cable allows many types of wired handheld mics to be used with these transmitters. Low output mics may require a step-up transformer (Shure A97A, or equal)
- 6) Wired (i.e., non-"PT") versions of these mics may not use same color code.
- 7) These mics have very high output and may not use same color code.
- 8) These mics have very high output and may overdrive the transmitter. If you experience difficulties, please consult your dealer or the Vega factory.
- 9) Some late model Crown PZM mics are not wireless compatible.

098-0306F

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