



Receive Antenna Interface for Transceivers

DXE-RTR-1

Patent Pending

DXE-RTR-1-INS Revision 4



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Introduction

The **DXE-RTR-1** Receive Antenna Interface for Transceivers is a unique and simple, multi-purpose relay unit which automatically switches the RF output antenna connector on any HF transceiver between a receiving antenna system and a standard transmitting antenna. A manual override switch allows instantaneous switching between transmit and receive antennas.

Designed specifically for HF transceivers which do not have a receive antenna input, the **DXE-RTR-1** enables operators to safely enjoy the improved reception of low noise receiving antenna system. Connection to Beverages, Reversible Beverages, Active Receive Antennas, and other receiving antennas and accessories is now possible, only with the **DXE-RTR-1**.

“An Amateur Radio Dilemma”

The benefits of using separate receiving antennas for “low-band” HF operations have been known for many years. Enthusiasts of operations below 14 MHz have learned that typical transmitting antennas collect too much noise for reception, especially for DXing on the 160 and 80 meter bands.

Unfortunately, for over three decades, only the most expensive HF transceivers have been manufactured with a separate receive antenna input. Even so, many older and newer “high-end” radios do not provide for switching their reception between a receive antenna and the default transmit antenna, nor do they interrupt the receive input during transmit. To obtain a separate receive antenna input, certain models required optional equipment or modules which are no longer available.

For many Amateur Radio Operators, the joy of low-noise, low-band reception with a separate receive antenna has been out of reach. Modern, “affordable” HF transceivers have been designed without any provision for a receive antenna connection. Otherwise very capable transceivers, even brand new models, lack a built-in receive antenna port and relay system.

The DX Engineering Solution

The **DXE-RTR-1** Receive Antenna Interface for Transceivers, offers a special antenna switching solution, that incorporates safeguards against accidental RF transmission into a receive antenna system. The **DXE-RTR-1** may be used for switching flexibility and to protect the receiver input during transmit for those transceivers that are so equipped.

Typical homebrew and commercial transmit/receive (T/R) relays, and other receive switching solutions on the market, offer little or no protection to the receive antenna equipment. Transmitted energy could damage receiving equipment if keying and timing errors or power loss occurs.

The **DXE-RTR-1** is a new HF relay system that allows reception only if the unit is powered and the keying line from the transceiver is connected. As soon as the transceiver is keyed *or* the **DXE-RTR-1** loses power at any time, the RF output from the transceiver is automatically diverted to the transmit antenna connection. A very fast acting (about 4 ms) 200 watt RF capable relay in the **DXE-RTR-1** diverts the transceiver output quickly enough for QSK operation (full break-in CW)

while listening to a receive antenna. The **DXE-RTR-1** also allows instantaneous receive comparisons between the receive antenna and the transmit antenna, with a convenient three-position front panel switch. Indicator LEDs (Light Emitting Diodes) on the front panel allow the user to determine at a glance if the unit is properly powered and if the receive or transmit antenna is selected for reception and when the unit is keyed for transmission.

Features

- Attractive, Heavy Stainless Steel Enclosure that won't slide on your desk
- Front Panel LED Status Indicators and Manual Override Switch
- 200 Watt Transmit Switching Capability
- Supports CW full break in (QSK)
- Receive Antenna Inputs and Outputs use RCA phono and Type F connectors for safety
- Main Antenna and Radio Connectors are SO-239 for ease of installation
- Safe switching - automatically connects radio to transmit antenna when dc power is off
- Hot switching lockout – disconnects receive antenna during transmit mode
- Adds protection and antenna switching flexibility - for transceivers with receive ports

The **DXE-RTR-1** Receive Antenna Interface for Transceivers is an attractive station accessory, housed in a heavy, stainless-steel enclosure which matches other DX Engineering station accessories. Cable connections to the **DXE-RTR-1** are made entirely on the back panel, and all switches and indicators are on the front panel, for a clean, easy-to-use installation.

General Information

The **DXE-RTR-1** Receive Antenna Interface for Transceivers is the accessory that allows owners of transceivers which lack a receive antenna input to safely enjoy optional receive enhancing equipment. The DX Engineering **DXE-RPA-1** Receive Pre-Amplifier may be used in-line on a receive antenna. The **DXE-NCC-1** Receive Antenna Variable Phasing Unit and the **DXE-AAPS-1** Active Antenna Phasing System are now available for operations for RX ANT Input deprived radios. The **DXE-RTR-1** may be combined with the **DXE-TVSU-1A** Time Variable Sequence Unit for high power operations at stations where the receive antenna is physically close to the transmit antenna and for status indication of keying.

Old and new transceivers alike can benefit from the use of a high performance, low-noise pre-amplifier to enhance reception. The **DXE-RPA-1** Receive Pre-Amplifier offers dynamic range and third order intercept performance that exceeds most top dollar transceivers. As requested by many Amateurs worldwide, the receive only **DXE-RPA-1** Receive Pre-Amplifier may now be used in-line safely for improved reception with a transmitting antenna, when connected with the **DXE-RTR-1**.

For enthusiasts who wish to use a favorite transceiver as a receiver only, now using an RF output connection to a receive pre-amplifier and antenna and can be virtually worry free. Accidental transmission through the receive antenna or receive pre-amplifier need not cause concern with a properly connected **DXE-RTR-1**.

Many owners of transceivers that **have** receive ports are choosing to use the **DXE-RTR-1**. For these operators it offers two benefits. First and foremost, the **DXE-RTR-1** can protect the front end of the transceiver with automatic disconnection of the receive input during transmit, preserving fast CW break-in operation (QSK) with a 4 ms response time. Second, the **DXE-RTR-1** offers a simple and handy way to toggle between listening to receive and transmit antennas with a front panel switch.

Most high-end transceivers, old and new, offer a receive antenna input that DOES NOT interrupt RF or switch off during transmit, even though the receiver is muted, very quickly in full break-in CW operation. This is a design feature which allows an operator to listen to a receive antenna, located a sufficient distance away from the transmit antenna to prevent receiver front end damage, allowing very fast QSK operations. However, most Amateurs who own this type of radio do not have access to the real estate for the required antenna separation to support this type of operation. Unfortunately, several hams have discovered these facts the hard way, after unintentionally blowing the front end of their expensive transceiver with transmitted RF riding in on their receive antenna feedline. Also, on many transceivers, connection of a receive antenna to the RX (antenna) IN port requires removal of the "RX OUT to RX IN" jumper patch cable, and then the transmit antenna cannot be heard. Recommendations for external relays and other devices have not addressed the need for protection as well as switching options. The **DXE-RTR-1** fills this need with an attractive and versatile accessory.

For those who want to use a separate receiver or use a second transceiver as a receiver and interrupt the receive antenna feedline when transmitting, the **DXE-RTR-1** may be used as a T/R relay. Also, monitoring the transmitting antenna with a second receiver while operating the main transceiver with a receive antenna (SO2R application) is possible with the **DXE-RTR-1**.

The **DXE-RTR-1** may also be used with an optional **DXE-RSC-2** Two-Port Splitter/Combiner to share a transmit antenna between two transceivers, with only one used for transmitting, or between a transceiver and a receiver.

Standard relays and coaxial relays that are used in a typical default receive T/R system are prone to keying timing problems which can result in damaging receiver front-ends due to pulses or hot switching. The **DXE-RTR-1** solves that problem for vintage radio collectors and operators. Used as a traditional T/R relay, it switches a transmit antenna between a receiver and a transmitter with an output of up to 200 watts. The **DXE-RTR-1** offers complete protection and high speed (4 ms) receive to transmit transfer. The **DXE-RTR-1** is a superior solution to old, slow T/R relays, and it allows the safe use of an optional receive preamplifier.

Detailed diagrams of the following applications and accessory connections are included in this manual.

Connecting a transceiver that does not have a receive antenna input to:

- **DXE-ARAV2-1P** Active Receive Antenna
- **DXE-ARAV2-1P** Active Receive Antenna and transmit Antenna using high power
- **DXE-NCC-1** Receive Antenna Variable Phasing Controller with two **DXE-ARAV2-1P** Active Receive Antennas
- **DXE-NCC-1** Receive Antenna Variable Phasing Controller with two **DXE-ARAV2-1P** Active Receive antennas using high power to the transmit antenna.
- Single transmit antenna system using a **DXE-RPA-1** Preamplifier
- Single transmit antenna system using a **DXE-RBS-1** Reversible Beverage Antenna System

- Single transmit antenna with a **DXE-RFS-TS2P** Receive Four Square Array Package
- One DX Engineering Monoband or Multi-band Vertical transmit antenna using a **DXE-ARAV2-1P** Active Receive Antenna with the **DXE-NCC-1** Receive Antenna Variable Phasing Controller

Connecting a transceiver that has a receive antenna input and receive output:

- For any receive antenna system interruption of receive antenna feedline during transmit
- For the versatility of switching between listening to either the receive or transmit antenna

Connecting a transmitter and receiver to the same antenna system:

- Classic T/R relay connections for separate Transmitter and Receiver with a Single Transmit Antenna System using a **DXE-RPA-1** Preamplifier

Connecting two transceivers, one used for receive only, to the same transmit antenna, for simultaneous reception.

- Using an optional **DXE-RSC-2** Two-Port Splitter/Combiner, a transmit antenna can be shared for dual receiving.

Connecting two transceivers, one used for receive only, to the same active receive antenna, for simultaneous reception.

- Using an optional **DXE-RSC-2** Two-Port Splitter/Combiner, a transmit antenna can be shared for dual receiving.

Other uses of the **DXE-RTR-1** are possible but not detailed in this manual:

- Connecting a non-active receive only antenna to a transceiver and transmitting antenna system
- Connecting a main transceiver and a second transceiver for single operator-two radio (SO2R) contesting.

Given the nature of Amateur Radio Operators and their interest in experimentation, there may be many other options available when using the **DXE-RTR-1** Receive Antenna Interface for Transceivers.

DXE-RTR-1 Receive Antenna Interface for Transceivers - Front Panel

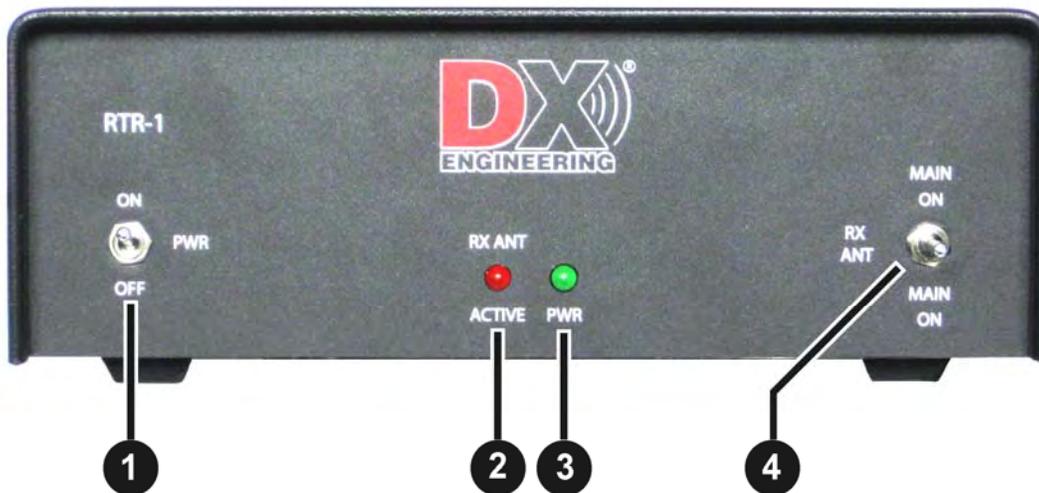


Figure 1

1 PWR ON-OFF

Toggle Switch - **DXE-RTR-1** power on and off. +12 Vdc power is supplied via the rear panel center positive connector.

2 RX ANT - ACTIVE indicator

One Red LED (Light Emitting Diode) illuminates to indicate the **DXE-RTR-1** is in the receive mode. This LED extinguishes when MAIN ON is selected or when keyed with RX ANT selected.

3 PWR indicator

One Green LED (Light Emitting Diode) illuminates to indicate the **DXE-RTR-1** is powered and turned on.

4 MAIN ON - RX ANT - MAIN ON toggle switch

Three position (On-On-plus Momentary) provides manual control of the **DXE-RTR-1** antenna selections.

MAIN ON (up) - Manually switches RADIO to the MAIN ANT for receiving with the transmitting antenna. RADIO remains connected to MAIN ANT during transmit.

RX ANT (center) - Switches the RADIO to the RX ANT for receive mode and allows automatic switching of the RADIO to the MAIN ANT during transmit.

MAIN ON (momentary on when pressed down) - Manually switches RADIO to MAIN ANT momentarily for a fast check of reception on the transmitting MAIN ANT.

DXE-RTR-1 Receive Antenna Interface for Transceivers - Rear Panel

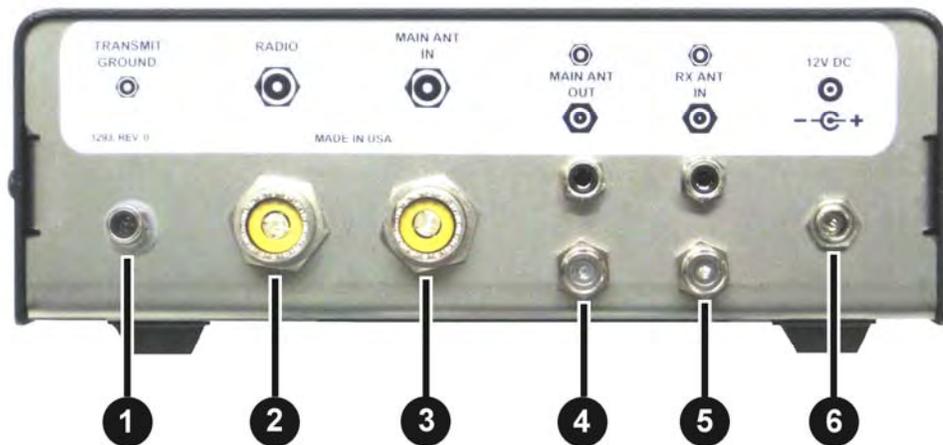


Figure 2

① TRANSMIT GROUND

Isolated RCA connector - Keying line connection from transceiver or sequencer (grounding keying line only) for automatic relay switching of RADIO from the RX ANT IN to the MAIN ANT. This connection to the transceiver is required to enable reception on a receive antenna; RX ANT through to RADIO with front panel MAIN ON/RX ANT switch in RX ANT position.

Note: If the keying line is shared (using a "Y" adapter) with an amplifier or amplifier interface buffer, then precautions should be taken to be certain that the transceiver to **DXE-RTR-1** connection is not interrupted.

If the keying line connection from the transceiver to the TRANSMIT GROUND connector on the **DXE-RTR-1** is lost, transmitted RF may cause damage to the **DXE-RTR-1** or receiving equipment.

This connector **MUST** be connected to the **grounded-on-transmit** transceiver keying line, cable shield to radio chassis ground, and the RADIO connector must be connected to the transceiver RF connector, cable shield to radio chassis ground, to enable receive mode.

Positive voltage keying will not key the **DXE-RTR-1** properly.

Damage to the **DXE-RTR-1** could occur by attempting to use positive voltage keying. Review your transceiver operation manual carefully. Transceivers with positive keying only must be connected to an interface buffer to provide grounding-on-transmit keying.

② RADIO

SO-239 connector - Transmit and receive RF connection to the transceiver or connection to transmitter RF connector. Maximum 200 Watts transmit with MAIN ANT connected to a suitable antenna or load. Connected, by default, to the MAIN ANT IN connector when the **DXE-RTR-1** is not powered or the MAIN ANT/RX ANT switch in the MAIN ANT position.

③ MAIN ANT IN

SO-239 connector - RF connection to a suitable transmit antenna or load. Connected, by default, to the RADIO connector when the **DXE-RTR-1** is not powered or the MAIN ANT/RX ANT switch in the MAIN ANT position. Connection for high end transceiver "RX OUT" to monitor transmit antenna through **DXE-RTR-1**. Details in **Diagram 1B** and text.

④ MAIN ANT OUT

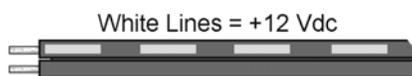
RCA type connector and F-Connector (in parallel) - Output for special applications, receive only connection of MAIN ANT during receive mode only. Used for transmit antenna monitoring and pre-amplification or phasing purposes only. Disconnected during transmit or when unit is switched to MAIN ANT. See Diagrams 5 and 8.

⑤ RX ANT IN

RCA type connector and F-Connector (in parallel) - Input for receive only antenna, or from a receive only device. May accept output from a **DXE-RPA-1** Receive Preamp, or from a **DXE-NCC-1** Receive Antenna Variable Phasing Controller.

⑥ 12 VDC

A 2.1 mm power cord is supplied with unit. The wire with the white stripes is the +12 Vdc.



Outer Connection is GROUND - - ⊕ + Center Pin is +12 VDC.



If station power is used, it must be +12 Vdc at 1 amp (fused) minimum. An optional **DXE-PSW-12D1A** 120 Vac 60 Hz to 12 Vdc 1 Amp, fused wall transformer supply is available.

Internal Jumpers

There are two internal jumpers set to factory default positions. HD1 and HD2 are jumpered by default to the top two pins towards the HD1 and HD2 lettering on the printed circuit board for proper operation as shown in **Figure 3**. HD1 and HD2 are reserved for possible future options.



Figure 3 - Internal Jumpers HD1 and HD2

Connection Descriptions

The diagrams included in this manual demonstrate the wide variety of specific connections that are possible with the **DXE-RTR-1**, truly a multi-purpose device. These connections are simple and straightforward and do not require advanced electronics skill.

Connect a regulated station power supply which provides a 1 A fused 12 Vdc to the **DXE-RTR-1** power connector on the back panel. With the included 2.1 mm power cord, the power connector must be wired center positive. If a station power supply is not available, connect the optional **DXE-PSW-12D1A** Wall Transformer.

Typical interconnections between the **DXE-RTR-1**, the transceiver, antennas and accessory equipment are made with commonly available or easily made patch cords. Plans should be made to locate the **DXE-RTR-1** close to the transceiver, so instant reception antenna changes may be made with the front panel switch.

Receive only connections must be made with either male RCA phono style patch cords or with male F connector cables. Custom length cables with F-Connectors installed can be supplied by DX Engineering. If RCA phono style patch cords are used, high quality connectors should be selected for this low-noise RF application. Inexpensive audio cables may not be suitable. RCA Phono and F-Connectors are used on DX Engineering receive devices to help prevent accidental connection to transmitting connectors.

Transmitting RF connections on the **DXE-RTR-1**, from RADIO to the transceiver and from MAIN ANTENNA to the transmitting antenna system, tuner or amplifier are made with standard PL-259 patch cables in lengths that permit locating the equipment in their proper operating positions. Custom length cables with PL-259 connectors installed can be supplied by DX Engineering.

The TRANSMIT GROUND keying line connection to the **DXE-RTR-1** must be made to enable reception with a connected receive antenna or accessory. Keying line connection from transceiver or sequencer (grounding keying line only) for automatic relay switching of RADIO from the RX ANT IN to the to MAIN ANT.

This connection may be shared with an amplifier-transceiver interface buffer keying input. The diagrams in this manual show connections to transceivers with grounded-on-transmit keying line only.

Note: If the keying line is shared (using a "Y" adapter) with an amplifier or amplifier interface buffer, then precautions should be taken to be certain that the transceiver to **DXE-RTR-1** connection is not interrupted.

If the keying line connection from the transceiver to the TRANSMIT GROUND connector on the **DXE-RTR-1** is lost, transmitted RF may cause damage to the **DXE-RTR-1** or receiving equipment.

The TRANSMIT GROUND keying line connector **MUST** be connected to a grounded-on-transmit transceiver keying line, cable shield to radio chassis ground, and the RADIO connector must be connected to the transceiver RF connector, cable shield to radio chassis ground, to enable receive mode.

Positive voltage keying will not key the **DXE-RTR-1** properly.

Damage to the **DXE-RTR-1** could occur by attempting to use positive voltage keying. Review your transceiver operation manual carefully. Transceivers with positive keying only, must be connected to an interface buffer to provide grounding-on-transmit keying.

Receiving Antenna Spacing Guidelines

The overall benefits that receiving antenna offer is less noise. Weak signals can be heard on a dedicated receive antenna because it rejects noise and strong stations by virtue of its design, size, directivity and lower sensitivity.

Therefore, placement of a receiving antenna is very important. Normally, excellent results are achieved by placing a receive antenna in a low noise environment. If possible, receive antennas should be located at least 1/2-wavelength away from noise sources and noise re-radiating antennas. Houses, other metal or structures containing metal, metal fencing, towers and transmitting antennas can introduce noise into a receive antenna by proximity which may reduce the effectiveness of a receive antenna.

However, in many cases, the physical space required for the ideal receive antenna installation is not available to the average back yard. The following diagrams (1-7) of typical and special system configurations show absolute minimum spacing between transmitting and DX Engineering Active Receive Antennas. For optimal performance, greater spacing is recommended for better reception results.

Diagram 8 shows phasing of a mono-band or multi-band vertical antenna using a **DXE-ARAV2-1P** Active Receive Vertical Antenna with the **DXE-NCC-1** Receive Antenna Phasing Controller. The spacing described is 1/4 to 1/2-wavelength between the transmit antenna and the Active Receive Antenna. This distance is based on optimal performance of the equipment described.

For in-depth receiving antenna system information, please consult the *ARRL Antenna Book* or *ON4UN's Low Band DXing* book.

Typical System Configurations

In most cases, the operator will purchase the **DXE-RTR-1** because they want to use a receive antenna on a transceiver which lacks a receive antenna input. See the text below and use Diagram 1B for an example using the **DXE-RTR-1** with a transceiver having a Receive Input and Output.

All transceivers under 200 watts output may be connected to the **DXE-RTR-1** as is shown in **Diagram 1A**, and all other **Diagrams 2** through **9**, even if it has a receive antenna input.

Diagram 1A illustrates the positions and connections to a standard transceiver for optional receive enhancement products from DX Engineering. A simple Beverage antenna or receiving loop antenna may be connected directly to the RX ANT connector on the **DXE-RTR-1**. If a single **DXE-ARAV2-1P** Active Receive Vertical is purchased, then the included powering device, model **DXE-FVI-1**, is placed in-line in the shack between the Active Receive Vertical and the RX ANT input, or between the optional **DXE-RPA-1** Receive Preamplifier and the **DXE-RFCC-1** Receive Feedline Current Choke.

Diagram 1B illustrates how to connect the **DXE-RTR-1** to a transceiver using available receive input and output connectors. For informational example purposes, here is a partial listing of the transceivers that can benefit from connections with the **DXE-RTR-1**: Yaesu FT-1000 series, FT-1000MP/ MKV series, FT-2000 series and FT-9000 series; Icom IC-7800, IC-7700, IC-7600, IC-765, IC-761 and IC-781.

Most high-end transceivers, old and new, offer a receive antenna input that DOES NOT interrupt or

switch off during transmit even though the receiver is muted. Also, on many transceivers, connection of a receive antenna to the RX IN port means that the RX OUT to RX IN jumper patch cord must be removed. Then the transmit antenna cannot be heard. For operators of these high-end transceivers, the **DXE-RTR-1** offers two benefits. First and foremost, it can protect the front end with automatic disconnection of the receive input, preserving very fast break-in operation (full QSK) with 4 ms response. Second, the **DXE-RTR-1** offers a simple and handy way to toggle between listening to the receive and transmit antennas with a front panel switch.

The **DXE-RTR-1** RX ANT connector is used for the receive antenna system signals. The transceiver RF output is connected to the transmit antenna or amplifier. The transceiver amplifier keying line must be connected to the **DXE-RTR-1** TRANSMIT GROUND connector to enable reception of the receive antenna signal. Customer supplied RF patch cords must be used to connect to the SO-239 RADIO and MAIN ANT IN ports on the **DXE-RTR-1** to the RX IN and OUT ports on a transceiver, respectively, replacing the existing jumper patch cable. In most cases these are simply two patch cords with PL-259s on one end and male RCA phono plugs on the other end. This connection will never allow transmitted RF into the front end of the transceiver. Since the RX OUT carries only the received transmit antenna signals, the **DXE-RTR-1** will allow monitoring of either the receive or transmit antenna as described in this manual. This connection scheme is applicable for the radios listed above, as well as others not listed, which offer RX IN and OUT. This transceiver connection scheme may also be adapted for use with any of the diagramed system configurations. If your transceiver has only a receive antenna input but no RX OUT, use the standard connection methods depicted in Diagrams 1a and 2 through 9.

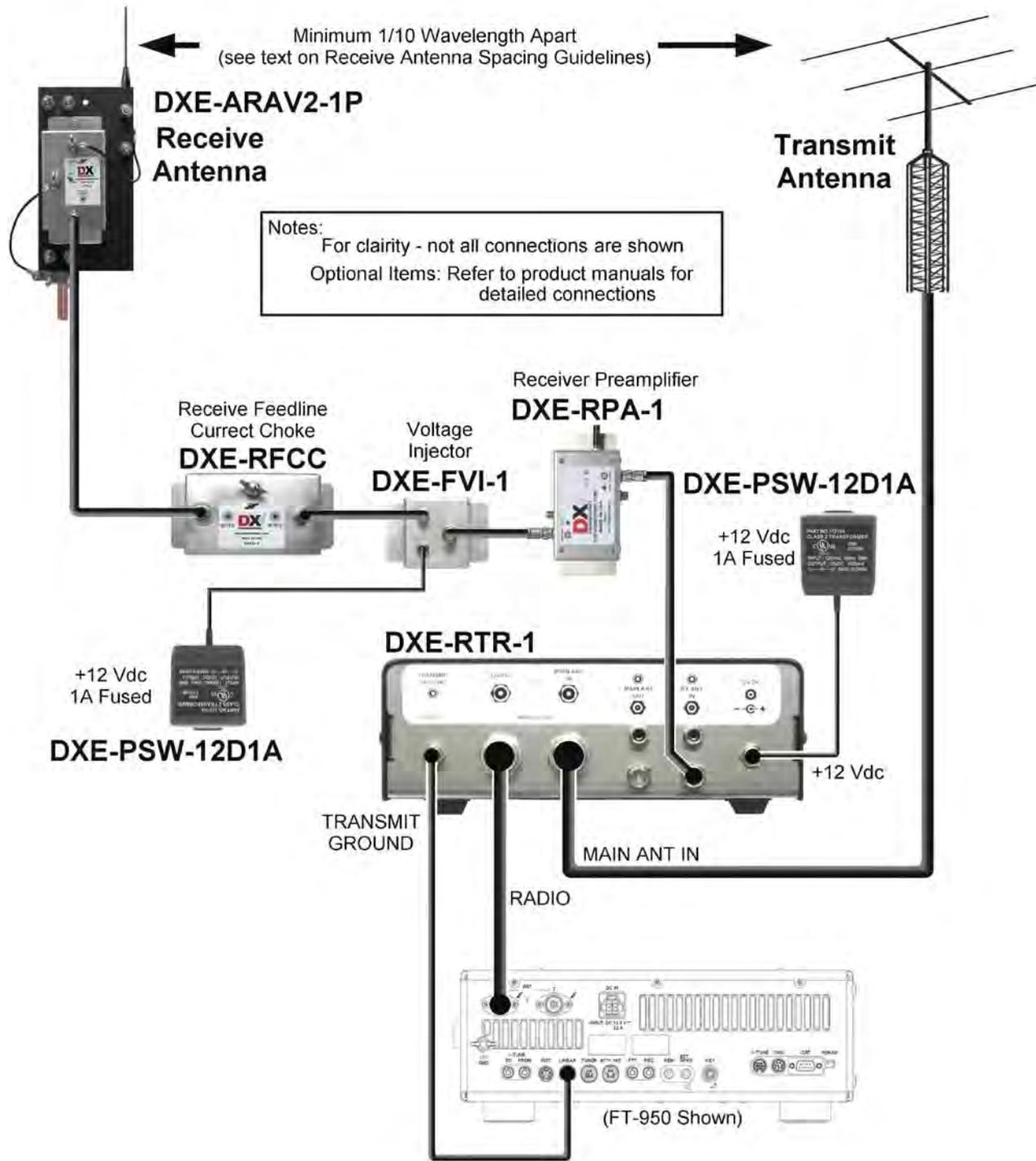
Diagram 2 shows a standard transceiver connection arrangement, with the addition of a typical RF amplifier used on the transceiver output for high power operations. The **DXE-RTR-1** and a keyed-on-ground amplifier may be able to share the same grounding keying line from the transceiver, but the use of an optional amplifier keying interface buffer is recommended. Do not share the keying line of the **DXE-RTR-1** with an older amplifier that uses high voltage relays.

NOTE: The **DXE-RTR-1** may never be used on the output of an RF amplifier. **MAXIMUM RF power allowed through the unit is 200 watts.**

Note: If the keying line is shared (using a "Y" adapter) with an amplifier or amplifier interface buffer, then precautions should be taken to be certain that the transceiver to **DXE-RTR-1** connection is not interrupted. If the keying line connection from the transceiver to the TRANSMIT GROUND connector on the **DXE-RTR-1** is lost, transmitted RF may cause damage to the **DXE-RTR-1** or receiving equipment.

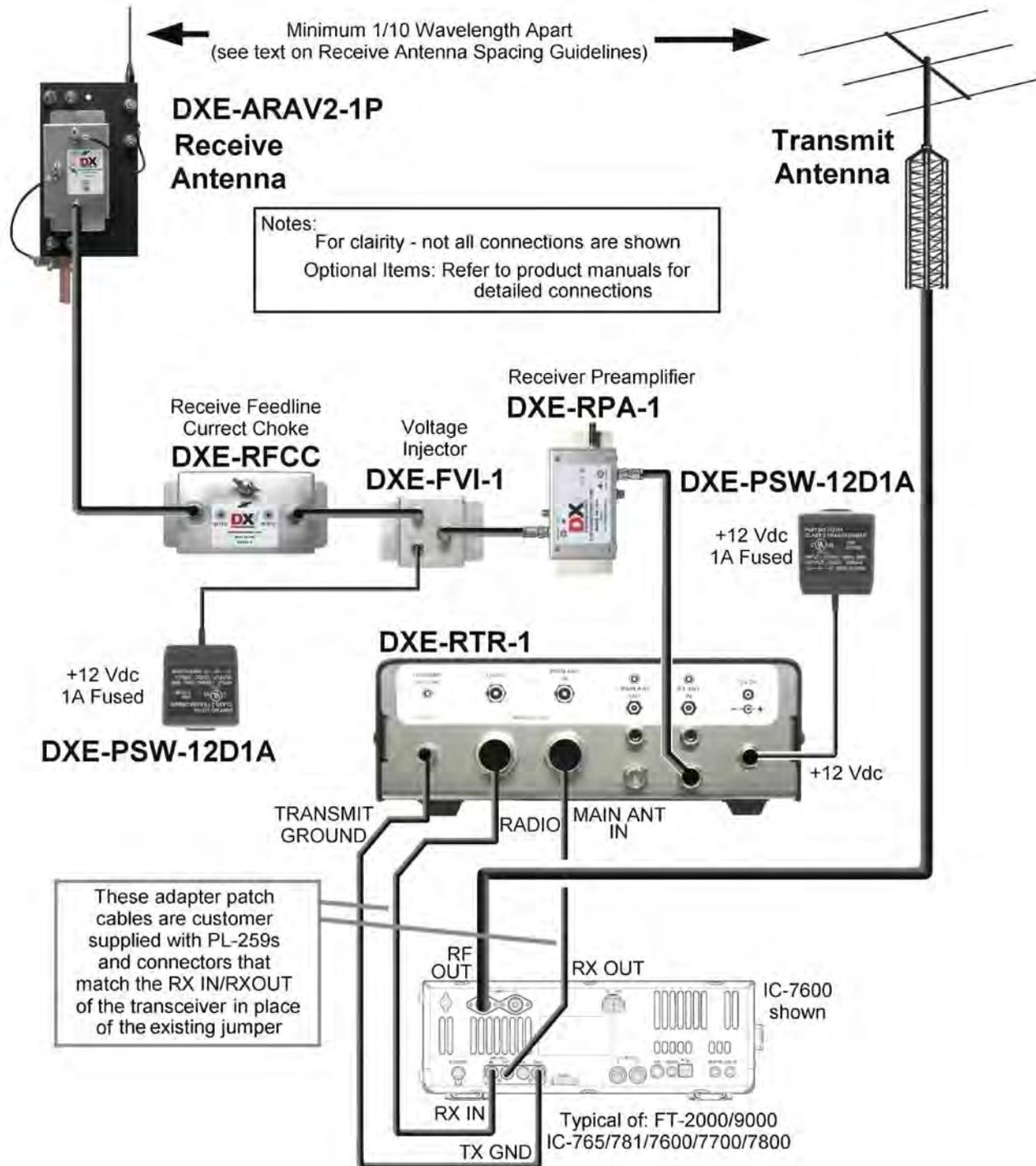
The TRANSMIT GROUND keying line connector **MUST** be connected to a **grounded-on-transmit** transceiver keying line, cable shield to radio chassis ground, and the RADIO connector must be connected to the transceiver RF connector, cable shield to radio chassis ground, to enable receive mode. Positive voltage keying will not key the **DXE-RTR-1** properly. Damage to the **DXE-RTR-1** could occur by attempting to use positive voltage keying. Review your transceiver operation manual carefully. Transceivers with positive keying only must be connected to an interface buffer to provide grounding-on-transmit keying.

Diagram 1A - Active Receive Antenna and Transmit Antenna
Allows use of an active receive antenna with the added receive signal strength using a pre-amplifier.



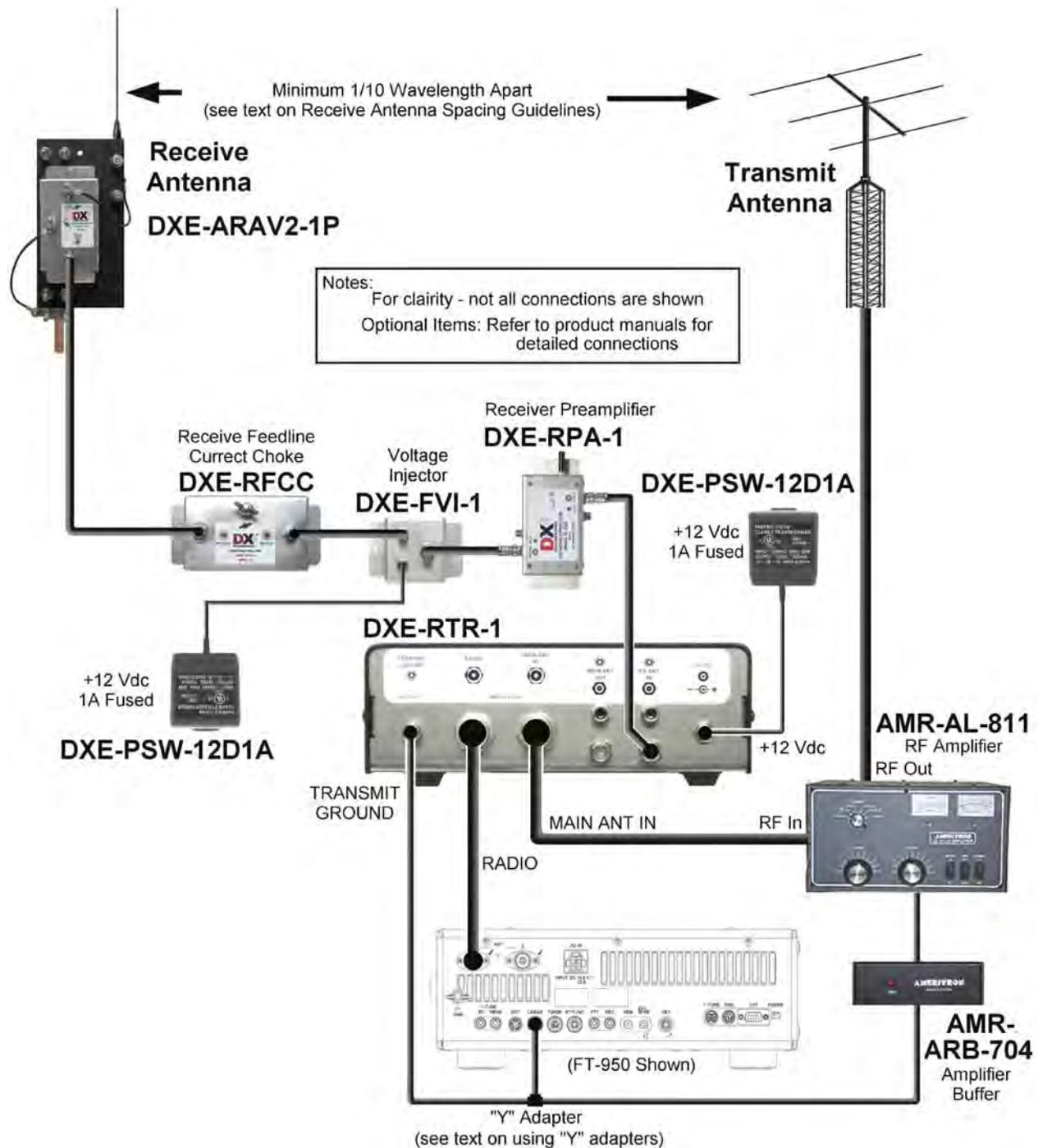
Optional items shown include: **DXE-ARAV2-1P** Active Vertical Receive Antenna w/ Internal Antenna Disconnect Relay, **DXE-RFCC** Receive Feedline Current Choke, **DXE-FVI-1** Voltage Injector, **DXE-RPA-1** Receiver Preamplifier and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformer.

Diagram 1B - Active Receive Antenna and Transmit Antenna
Allows use of an active receive antenna with the added receive signal strength using a pre-amplifier connected to a transceiver equipped with RX INPUT and OUTPUT ports.



Optional items shown include: **DXE-ARAV2-1P** Active Vertical Receive Antenna w/ Internal Antenna Disconnect Relay, **DXE-RFCC** Receive Feedline Current Choke, **DXE-FVI-1** Voltage Injector, **DXE-RPA-1** Receiver Preamp and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformer.

Diagram 2 - Active Receive Antenna and Transmit Antenna using High Power, allows use of an active receive antenna with the added receive signal strength using a pre-amplifier.



Optional items shown include: **DXE-ARAV2-1P** Active Vertical Receive Antenna w/ Internal Antenna Disconnect Relay, **DXE-RFCC** Receive Feedline Current Choke, **DXE-FVI-1** Voltage Injector, **DXE-RPA-1** Receiver Preamplifier, **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformer, Ameritron **AL-811** RF Amplifier and Ameritron **ARB-704** Amplifier Buffer.

Additional System Configurations

Diagram 3 shows an exciting new receiving application. The **DXE-RTR-1** Receive Antenna Interface for Transceivers now allows owners of transceivers which lack a receive antenna input to use a phased receive antenna array. This diagram shows the connections for use of the **DXE-AAPS-1P** Electronically Rotatable Receive Antenna System, which consists of two **DXE-ARAV2-1P** Active Vertical Receive Antennas with Internal Antenna Disconnect Relays and the **DXE-NCC-1** Receive Antenna Variable Phasing Controller using the **DXE-RTR-1** Receive Transmit Relay.

Diagram 4 details the connections to optional equipment required when operating high power and using the **DXE-AAPS-1P** Electronically Rotatable Receive Antenna System. The addition of the **DXE-TVSU-1A** Time Variable Sequencer Unit will produce the correct keying of all devices, to protect the Active Receive Antennas from high power RF damage. The **DXE-RTR-1** provides connection to the transceiver which does not offer a receive antenna input.

Diagram 5 includes the exceptional **DXE-RPA-1** Receive Preamplifier in-line with the main (transmit) antenna. For many years Amateurs have been requesting a method to employ a receiving device on their transceivers which lack a built-in preamplifier. The **DXE-RTR-1** provides this connection option. Instantaneous receive comparisons between 'preamplifier in' and 'preamplifier out' are easily accomplished using the **DXE-RTR-1** MAIN ON - RX ANT - MAIN ON toggle switch.

Receiving with the transmitting antenna on a second transceiver or receiver while operating with the main transceiver connected to a receive antenna is a common contesting application known as Single Operator – Two Radios (SO2R). This is now easily accomplished by connecting the MAIN ANT OUT line to the input of the second radio. Reception with the transmitting antenna is safely interrupted during main transceiver transmissions.

Diagram 6 demonstrates another common use for the **DXE-RTR-1** and the connections required for use of a two direction **DXE-RBS-1P** Reversible Beverage Antenna System.

Diagram 7 shows how a **DXE-RFS-TS2P** Complete Receive Four Square Array Package for Close Spacing to Transmit Antennas is connected to a transceiver that does not offer a receive antenna input.

Diagram 8 illustrates the use of the **DXE-RTR-1** with a **DXE-MBVA-1UP** Multi-band Vertical Transmit Antenna (a monoband vertical antenna may also be used) one **DXE-ARAV2-1P** Active Vertical Receive Antenna with Internal Antenna Disconnect Relay, and the **DXE-NCC-1** Receive Antenna Variable Phasing Controller. This combination allows the user to null strong receive signals and noise in certain directions, opening up new reception possibilities. When using the **DXE-RTR-1**, the Multi-band Vertical transmit antenna can be phased with the Active Receive Antenna using the **DXE-NCC-1** Receive Antenna Variable Phasing Controller. The antennas being phased should be the same polarization for optimal results.

Refer to the manual for the **DXE-NCC-1** Receive Antenna Variable Phasing Controller (available for viewing or downloading on the DX Engineering website) for more details on directional signal and noise nulling.

Diagram 9 demonstrates how the **DXE-RTR-1** may be used in a classic T/R relay application with an added bonus! The popular optional accessory for older receivers, the DX Engineering Receive Preamplifier model **DXE-RPA-1**, may be used safely, for improving reception on the transmit antenna, especially on higher frequencies. When the pre-amp is not required, it may be internally bypassed by removing the DC power to it.

Set the **MAIN ON - RX ANT - MAIN ON** toggle switch to the RX ANT (center) position to connect the MAIN ANT to your receiver. When you key the transmitter, the **DXE-RTR-1**'s automatic 4 ms changeover from receive to transmit switches the MAIN ANT to the transmitter. Manually switching the toggle switch to the MAIN ON (up) position connects the MAIN ANT to the transmitter, if desired for tune up operations. *The power limit for the transmitter is 200 watts.*

The keying line from the transmitter* must be a Ground-On-Transmit type, as the **DXE-RTR-1** cannot accept any keying voltage. If the only keying line from the transmitter is a positive or negative voltage type, then an Ameritron **AMR-ARB-704** must be used in the transmitter keying line, as shown in **Diagram 9**. The ARB-704 will accept any keying voltage, 12 volts positive or negative and provides the Ground-On-Transmit keying for the **DXE-RTR-1**.

A muting line from the transmitter which may provide a ground for an older receiver, cannot be shared with the **DXE-RTR-1**, as many old receivers* require the grounding of a high voltage for muting.

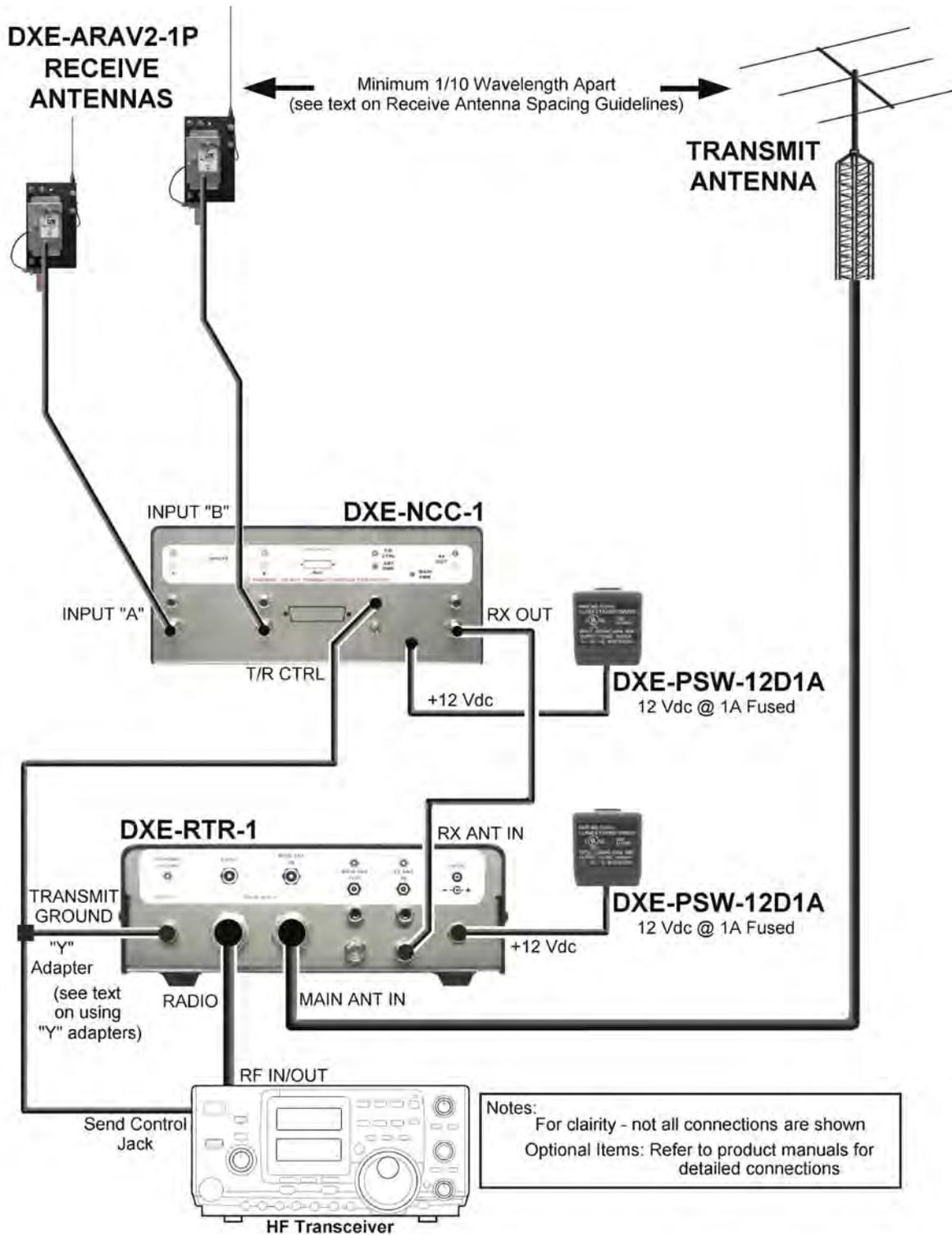
* *Refer to your transmitter and receiver instruction manuals for keying line and muting line information and requirements.*

In a special application with no receive antenna connections, **Diagram 10** illustrates using the **DXE-RTR-1** with an optional **DXE-RSC-2** Two-Port Splitter/Combiner to allow one transmitting antenna to be shared for simultaneous receive on two transceivers or with one transceiver and one receiver. The second radio is isolated from transmit energy by the **DXE-RTR-1**. Only the main transceiver may be used to transmit. The second transceiver that is connected to one of the **DXE-RSC-2** outputs must be transmit inhibited using either the radio's menu settings or power output controls set to zero to prevent system damage.

Set the **MAIN ON - RX ANT - MAIN ON** toggle switch to the RX ANT (center) position to connect the MAIN ANT to both radios for simultaneous reception. When you key the main transmitter, the **DXE-RTR-1** automatically changes from receive on both radios to transmit on the MAIN ANT in only 4 ms. The strong signal heard by the second radio is at a level that cannot damage its front end. Manually switching the toggle switch to the MAIN ON (up) position connects the MAIN ANT to the main transceiver, if desired for tune up operations, or for normal operations without the second radio. *The power limit for the transmitter is 200 watts.*

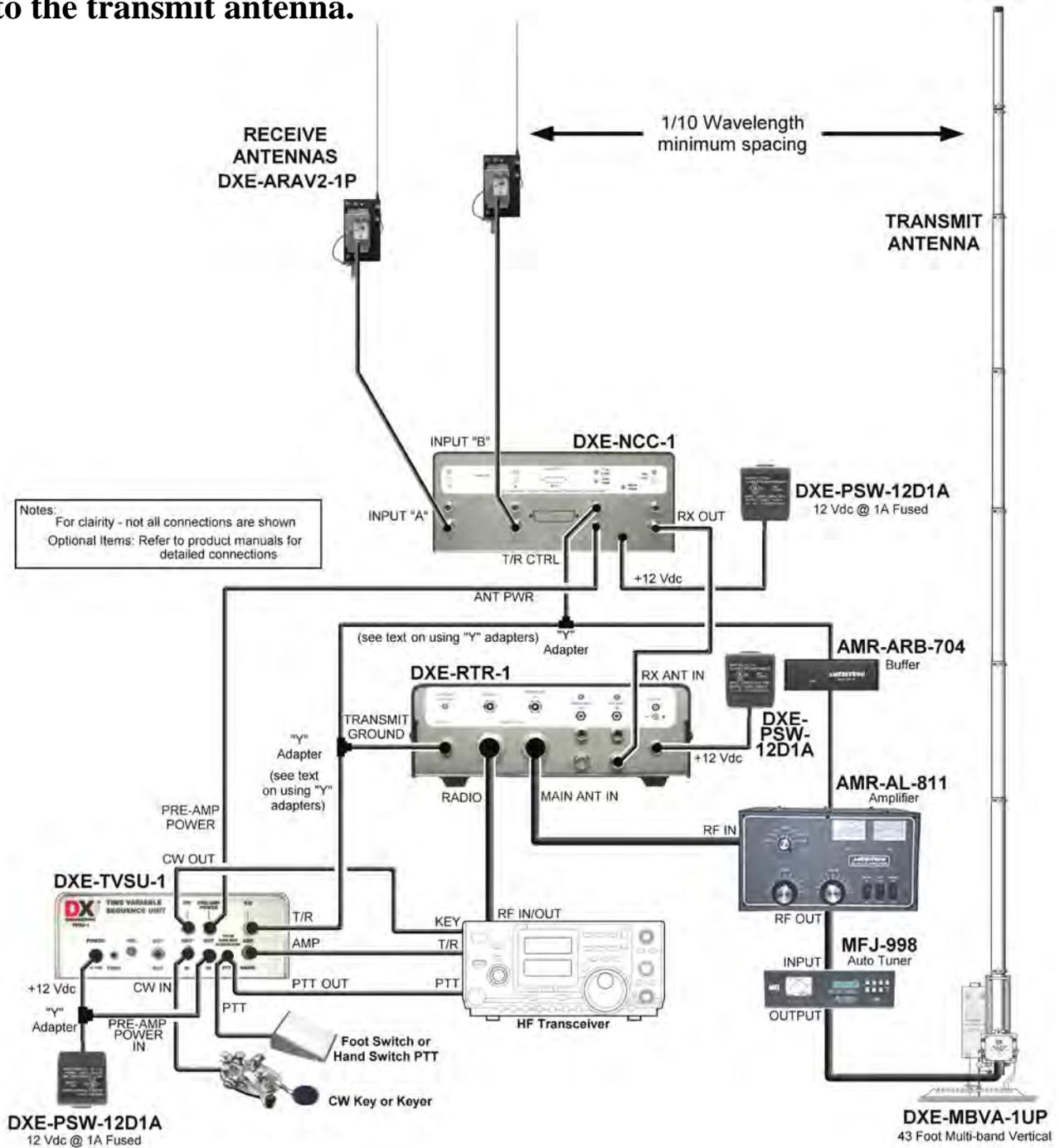
Diagram 11 demonstrates how the **DXE-RSC-2** Two-Port Splitter/Combiners can be used to split the active receive signal to the **DXE-RTR-1** and a second radio. In most low band operations, the receive antenna system will provide superior reception compared to the transmit antenna. An active receive antenna offers the signal-to-noise advantage that allows weak DX signals to be heard which would otherwise be covered by noise when listening with the transmit antenna. The second transceiver that is connected to one of the **DXE-RSC-2** outputs must be transmit inhibited using either the radio's menu settings or power output controls set to zero to prevent system damage.

Diagram 3 - DXE-NCC-1 Receive Antenna Variable Phasing Controller with two Active Receive Antennas



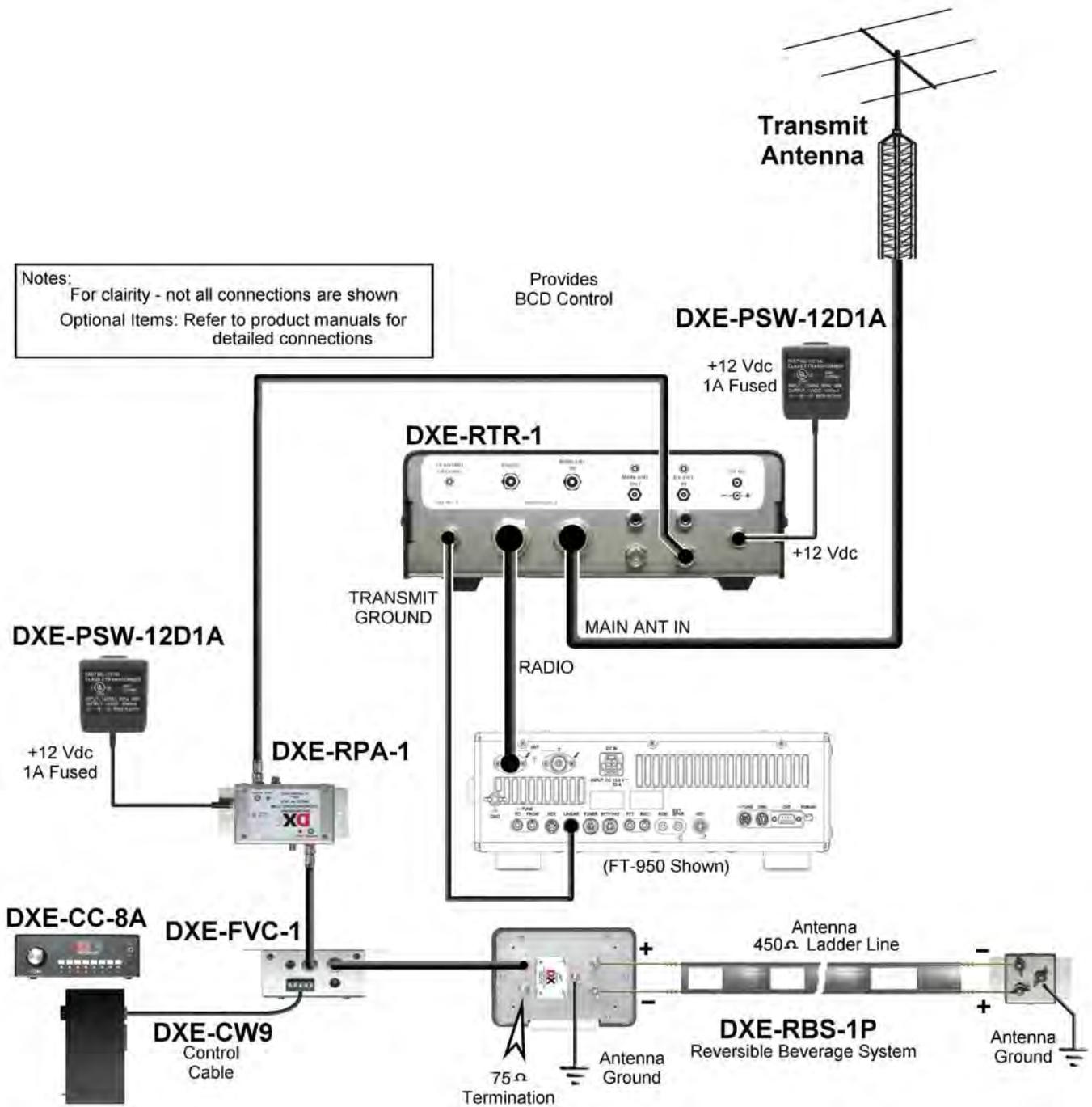
Optional items shown include: **DXE-ARAV2-1P** Active Vertical Receive Antennas with Internal Antenna Disconnect Relays. **DXE-NCC-1** Receive Antenna Variable Phasing Controller and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers.

Diagram 4 - DXE-NCC-1 Receive Antenna Variable Phasing Controller with two Active Receive Antennas using high power to the transmit antenna.



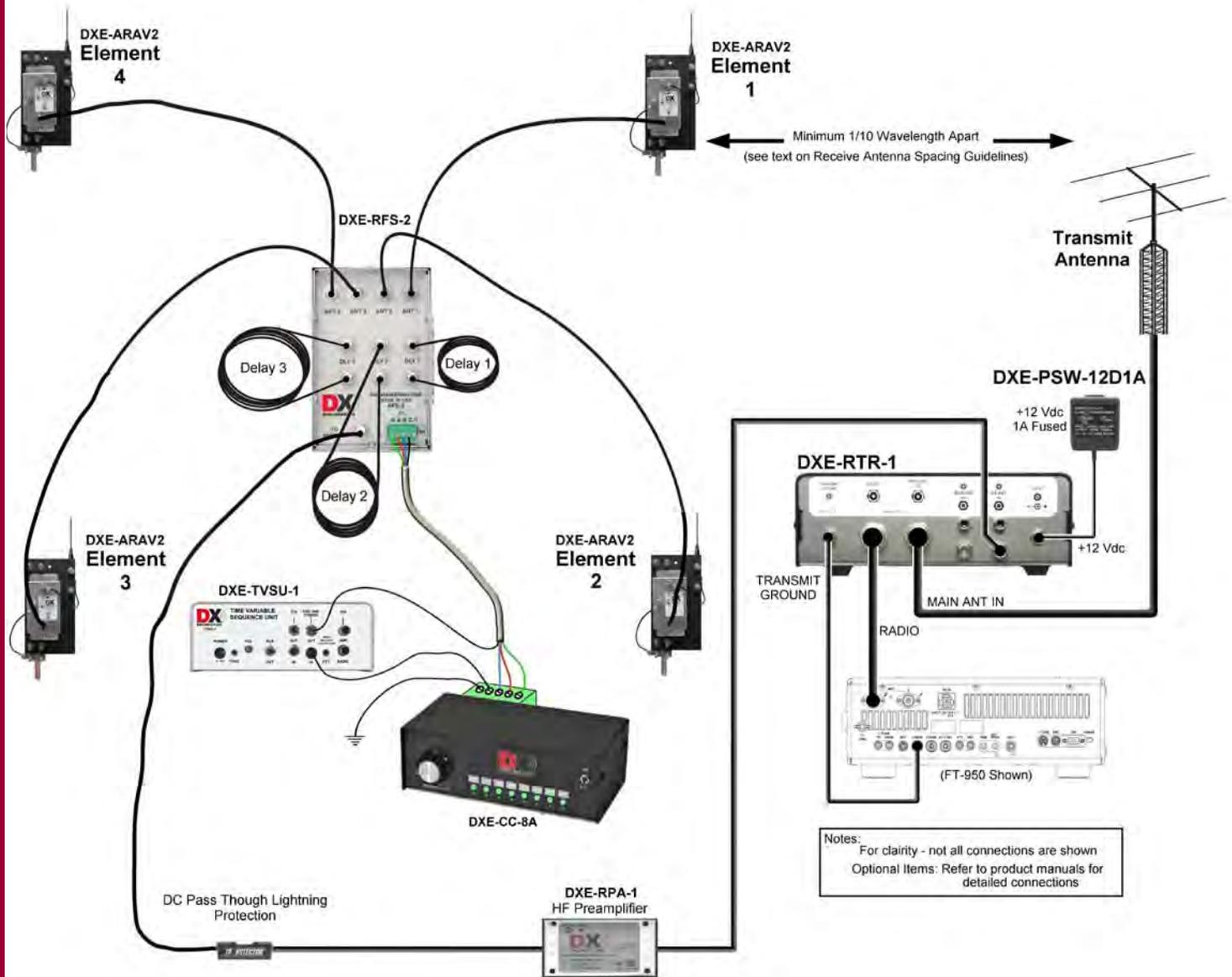
Optional items shown include: **DXE-AAPS-1P** Electronically Rotatable Receive Antenna System (which includes two **DXE-ARAV2-1P** Active Receive Antennas and one **DXE-NCC-1** Receive Antenna Variable Phasing Controller), **DXE-TVSU-1A** Time Variable Sequencer Unit, Ameritron **AL-811** Amplifier, Ameritron **ARB-704** Buffer, **MFJ-998** Antenna Intellituner, CW Key, Foot Switch, **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers and the **DXE-MBVA-1UP** Multi-band Vertical Antenna.

Diagram 6 - Single Transmit Antenna System using a DXE-RBS-1 Reversible Beverage Antenna System



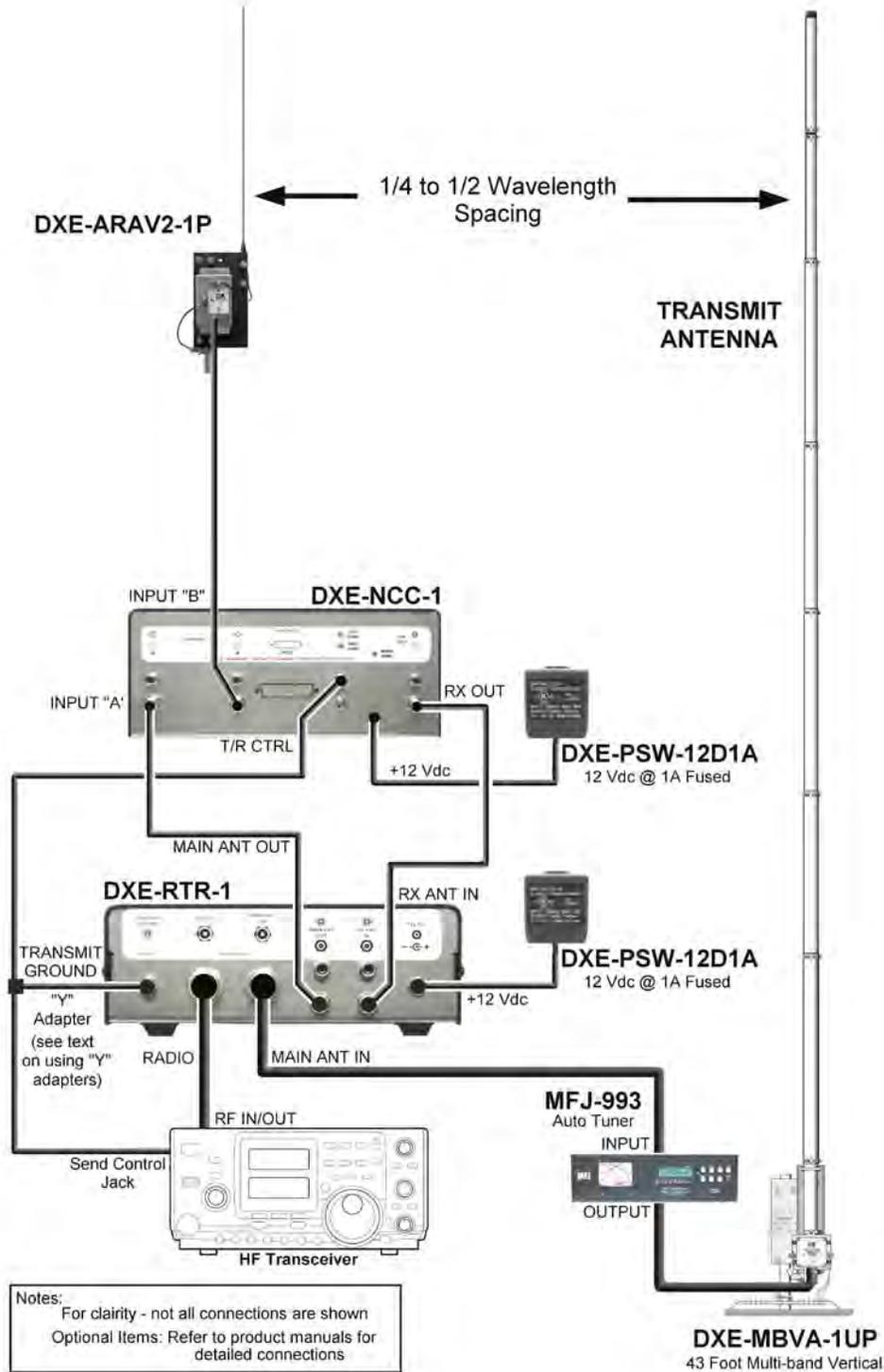
Optional items shown include: **DXE-RBS-1P** Reversible Beverage Antenna System - Two Direction, **DXE-CC-8A** Control Console, **DXE-FVC-1** Feedpoint Voltage Coupler, **DXE-RPA-1** Receiver Preamplifier and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers.

Diagram 7 - Single Transmit Antenna with the DXE-RFS-TS2P Receive Four Square Array Package for Close Spacing to Transmit Antennas



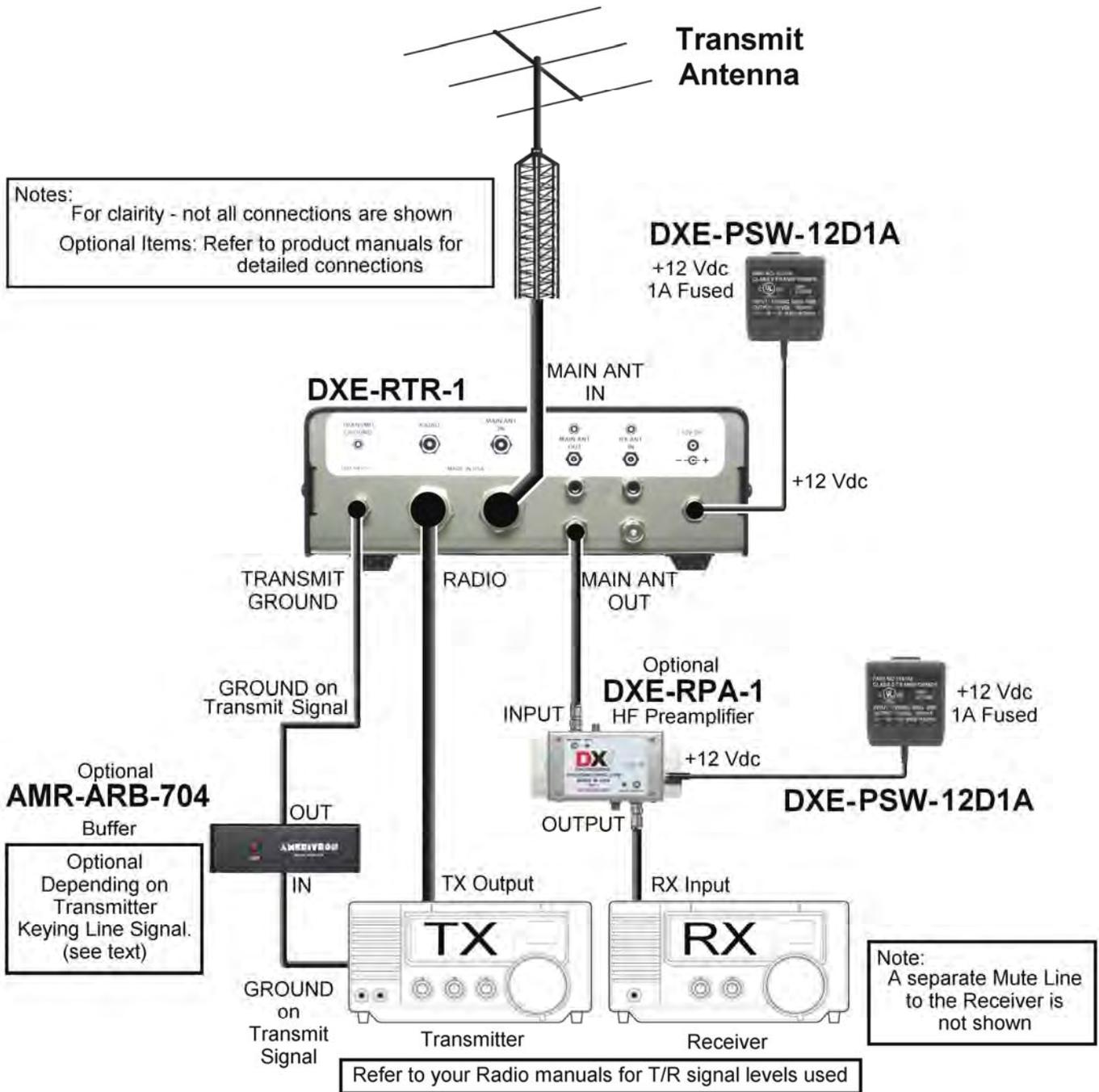
Optional items shown include: **DXE-RFS-TS2P** Receive Four Square Array Package for Close Spacing to Transmit Antennas, (which includes: (1) **DXE-ARAV2-4P** Package of 4 Active Receive Vertical Antennas w/ Internal Antenna Disconnect Relays, (1) **DXE-RFS-2** Receiving Four Square Antenna Switch, (1) **DXE-CC-8A** 8 Position Control Console, (1) **DXE-TVSU-1A** Time Variable Sequence Unit, (1) **DXE-F6-1000** CATV F-6 Style Coax, 75 ohm, F6 Flooded for Direct Burial, 1000' Spool, (25) **DXE-SNS6-25** Snap-N-Seal 75 Ohm Coax Connectors for CATV F-6 Cable, (1) **DXE-SNS-CT1** Crimp Tool for Snap-N-Seal 75 Ohm Coax Connectors, (1) **DXE-CPT-659** CATV F-6, RG-6 and RG-59 Coax Cable Stripper, Includes 1 Replacement Blade), **Tanstector** Lightning Protector, 75 ohm, DC Pass, Type F Connectors, **DXE-RPA-1** Receiver Preamp and a **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformer.

Diagram 8 - One Monoband or Multi-band Vertical Antenna phased with a DXE-ARAV2-1P Active Receive Antenna using the DXE-NCC-1 Receive Antenna Variable Phasing Controller



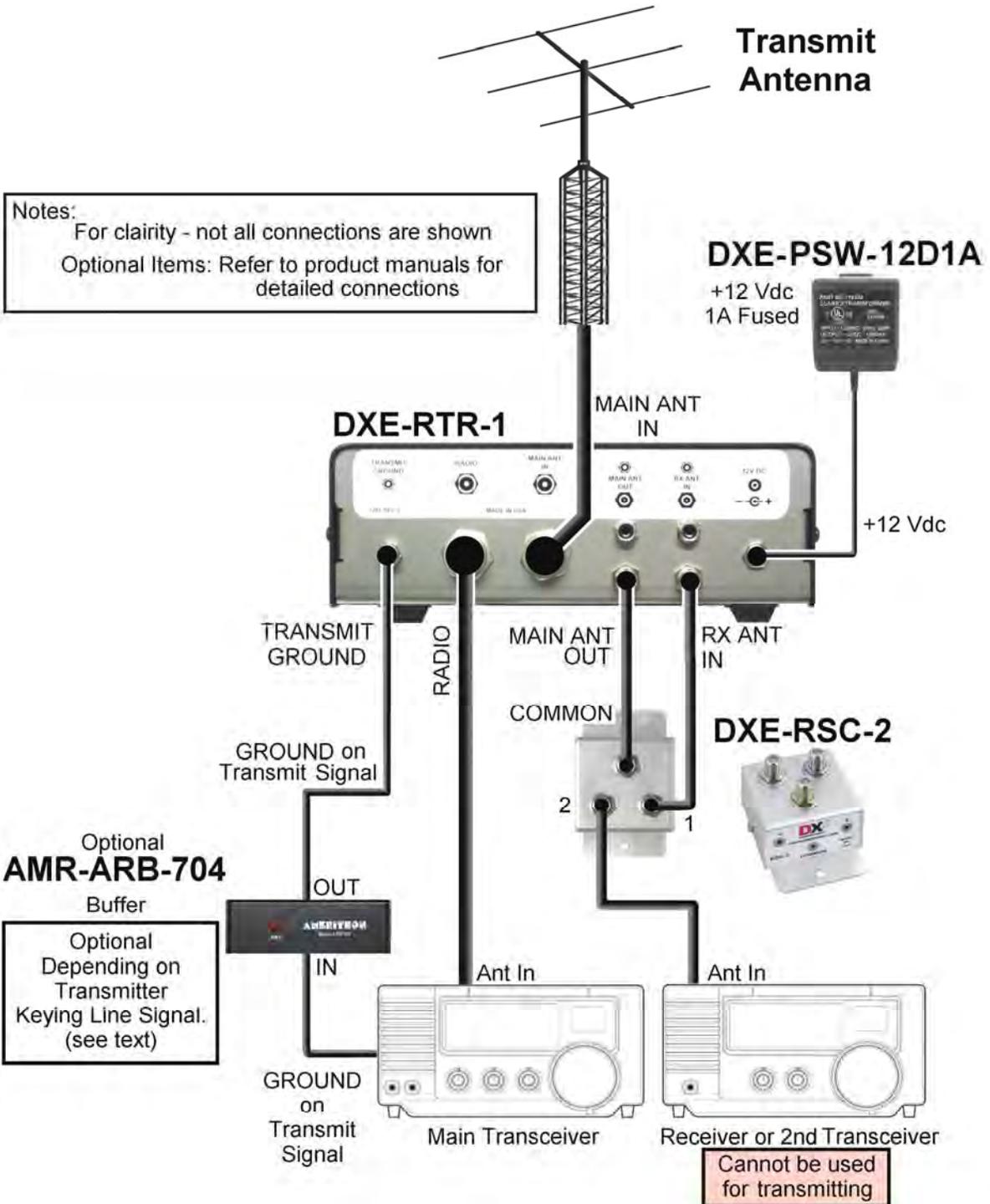
Optional items shown include: **DXE-ARAV2-1P** Active Receive Antenna, **DXE-NCC-1** Receive Antenna Variable Phasing Controller), two **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers the **DXE-MBVA-1UP** Multi-band Vertical Antenna and a wideband MFJ-993B automatic tuner.

Diagram 9 - Classic T/R relay connections for separate Transmitter and Receiver with a Single Transmit Antenna System using a DXE-RPA-1 Preamplifier



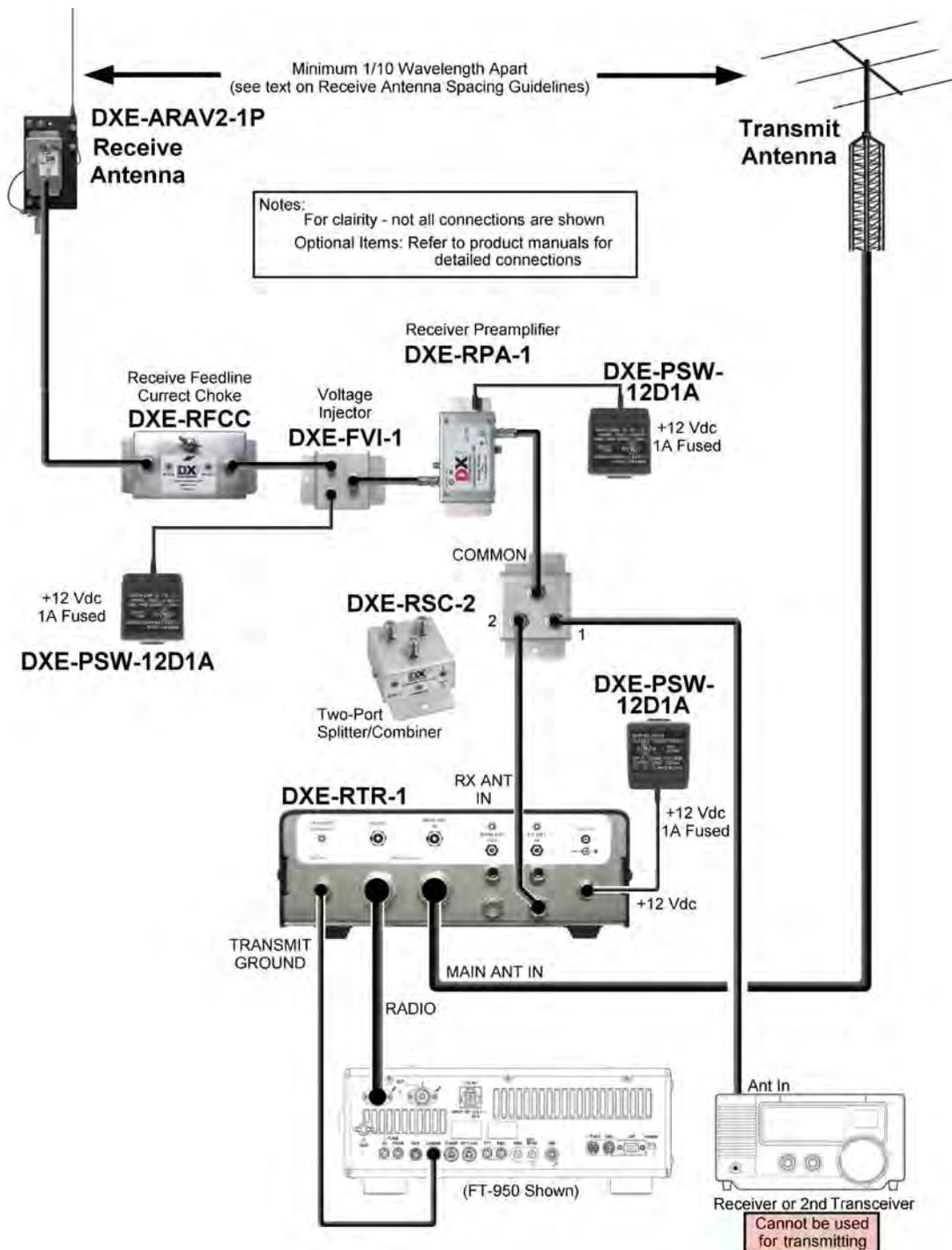
Optional items shown include: **DXE-RPA-1** Receiver Preamplifier, Ameriton **ARB-704** Buffer and two **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers.

Diagram 10 - Relay connections for separate Transceiver and Receiver with a Single Transmit Antenna System using a DXE-RSC-2 Two-Port Splitter/Combiner



Optional items shown include: **DXE-RSC-2** Two-Port Splitter/Combiner, Ameriton **ARB-704** Buffer and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformer.

Diagram 11 - Relay connections for separate Transceiver and Receiver with an Active Receive and Single Transmit Antenna System using a DXE-RSC-2 Two-Port Splitter/Combiner



Optional items shown include: **DXE-RSC-2** Two-Port Splitter/Combiner, **DXE-ARAV2-1P** Active Receive Antenna, **DXE-RFCC** Receive Feedline Current Choke, **DXE-FVI-1** Voltage Injector, **DXE-RPA-1** Receiver Preamplifier, **DXE-RSC-2** Two-Port Splitter/Combiner and **DXE-PSW-12D1A** +12 Vdc fused 1 amp wall transformers.

Operation

Once all connections have been made and double checked, turning PWR on the **DXE-RTR-1** will illuminate the green LED.



The three position MAIN ON - RX ANT - MAIN ON toggle switch for manual control of the **DXE-RTR-1** antenna selections.

MAIN ON (toggle switch up)

Manually switches the transceiver (RADIO) to the MAIN ANT for receiving with the transmitting antenna. The transceiver will remain connected to MAIN ANT during transmit. The red LED will not illuminate.

RX ANT (toggle switch center)

Place the switch in this position for reception with a receive antenna. This position connects the RADIO to the RX ANT for receive mode on a receive antenna and allows automatic switching of the RADIO to the MAIN ANT during transmit. The red LED will illuminate only during receive with the receive antenna and will extinguish when the transceiver switches to transmitting.

MAIN ON (toggle switch momentary down)

Manually switches RADIO to MAIN ANT momentarily for a fast check of reception on the transmitting MAIN ANT.

Manual Updates

Every effort is made to supply the latest manual revision with each product. Occasionally a manual will be updated between the time your DX Engineering product is shipped and when you receive it. Please check the DX Engineering web site (www.dxengineering.com) for the latest revision manual.

Note: If the keying line is shared (using a "Y" adapter) with an amplifier or amplifier interface buffer, then precautions should be taken to be certain that the transceiver to **DXE-RTR-1** connection is not interrupted.

If the keying line connection from the transceiver to the TRANSMIT GROUND connector on the **DXE-RTR-1** is lost, transmitted RF may cause damage to the **DXE-RTR-1** or receiving equipment.

The TRANSMIT GROUND keying line connector **MUST** be connected to a **grounded-on-transmit** transceiver keying line, cable shield to radio chassis ground, and the RADIO connector must be connected to the transceiver RF connector, cable shield to radio chassis ground, to enable receive mode.

Positive voltage keying will not key the **DXE-RTR-1** properly.

Damage to the **DXE-RTR-1** could occur by attempting to use positive voltage keying. Review your transceiver operation manual carefully. Transceivers with positive keying only must be connected to an interface buffer to provide grounding-on-transmit keying.

Optional Items

DXE-PSW-12D1A AC Adapter 12VDC/1000mA

120 Vac 60 Hz input - 12 Vdc, 1 Amp, Fused Output. A standard 2.1 mm plug connection for 12 Vdc.

Outer Connection is GROUND  Center Pin is input for +12 VDC.



DXE-ARAV2-1P - Active Receive Antennas with Internal Disconnect Relay

DX Engineering's Active Receive Antenna Systems offer excellent receiving performance from 100 kHz to 30 MHz using a whip antenna element 102 in. long. DX Engineering's unique design makes it vastly superior to traditional active antennas in both strong signal handling and feedline decoupling. You get significantly better weak signal reception due to lower spurious signal interference and reduced noise. This antenna system is ideal for Amateur Radio or Shortwave Listening. The **ARAV2-1P** active antennas ground the antenna element when power is turned off. These models are used in installations when spacing from transmit antennas is less than 1/2 wavelength but more than 1/10 wavelength (on the lowest frequency). The units should be used with a sequencer like our **DXE-TVSU-1A** or other reliable means to ensure the units are powered off before any RF appears. Four of these can be used to build a high performance Receive Four-Square System using our Receive Four Square Controller.

Features

- Close Spacing from Transmit Antennas – element grounded at power-off
- Sensitive – weak signal sensitivity rivaling full size antennas
- Wide Bandwidth – 100 kHz to 30 MHz
- Excellent Strong Signal Handling – outstanding Third Order Intercept of +30 dBm
- Reduced Noise – quiet FET followers and exceptional feedline shield isolation
- Long Life – high quality stainless and brass mounting hardware, metal enclosure
- Compact – stainless steel tapered element has low visual and environmental impact
- Easy Mounting and Installation Flexibility – pre-drilled mounting plate and universal V-saddle clamps



DXE-RFS-TS2P - Complete Receive Four Square Array Package for Close Spacing to Transmit Antennas

Complete Receive Four Square Array package for Close Spacing to Transmit Antenna

- W8JI design
- Operates from 100 kHz to 30 MHz
- Excellent directivity in a small space for better signal-to noise ratio
- Switchable in four 90 degree spaced directions
- Reduced susceptibility to high angle signals compared to EWE, Flag, Pennant, or K9AY arrays

Complete Receive Four Square Array Package for Close spacing to transmit antenna includes:

- (1) DXE-ARAV2-4P Package of 4 Active Receive Vertical Antennas w/ Internal Antenna Disconnect Relays
- (1) DXE-RFS-2 Receiving Four Square Antenna Switch
- (1) DXE-CC-8A 8 Position Control Console
- (1) DXE-TVSU-1A Time Variable Sequence Unit
- (1) DXE-F6-1000 CATV F-6 Style Coax, 75 ohm, F6 Flooded for Direct Burial, 1000' Spool
- (25) DXE-SNS6-25 Snap-N-Seal 75 Ohm Coax Connectors for CATV F-6 Cable
- (1) DXE-SNS-CT1 Crimp Tool for Snap-N-Seal 75 Ohm Coax Connectors
- (1) DXE-CPT-659 CATV F-6, RG-6 and RG-59 Coax Cable Stripper, Includes 1 Replacement Blade



DXE-RPA-1 - Receiver Preamplifier, 0.3-35 MHz

This is the best HF low noise amplifier available. The RPA-1 is optimized for 0.3-35 MHz operating range. The push-pull amplifier design and robust components enable it to withstand high signal levels and operate when you need it most. The dynamic range of the RPA-1 is better than most receivers. The RPA-1 is suitable for indoor or outdoor installation, with the option of being powered through the coaxial feed. The metal housing provides shielding and improved lifespan. The unit uses RCA type phono jack and CATV F connector for the input and output connections, and has a relay that automatically bypasses the amplifier when dc power is removed.



DXE-NCC-1 - Receive Antenna Variable Phasing Controller

Unlike conventional IF noise blankers, the NCC-1 is designed to reduce noise or interference before it gets to the receiver. The NCC-1 can be effective on all types of noise, including interference (QRM) from unwanted signals. The NCC-1 allows the user to continuously adjust both phase and amplitude when combining two antenna inputs. The signal output to the receiver is the addition or subtraction of signals from two separate antennas. Unwanted noise can be removed or unwanted signals can be cancelled. Desired signals can be peaked or enhanced.

The NCC-1 generally works best when both antennas have similar patterns, polarization, and Signal-to-Noise ratios. For the most effective nulling of noise, both antennas must hear the same unwanted noise and should have similar polarization. The wanted and unwanted (QRM and QRN) signals must be arriving from different directions. Low noise active receive antennas such as the DXE-ARAV2-1P are extremely effective when used with the DXE-NCC-1. For an economical package of the DXE-NCC-1 and two DXE-ARAV2-1P antennas, see package number DXE-AAPS-1P.



Noise Nulling Receive Antenna Controller

- Reduce overload or interference by nulling a strong local signal or noise before it gets to your receiver
- Better and more stable nulling than any other noise canceller on the market
- Peak weak signals hidden under a strong signal on the same frequency
- Null out local AM broadcast stations
- Null out noise from power line arcing, lamp dimmers, motors and consumer electronics arriving from a single direction

Antenna Phasing Controller

- Best alternative to DX Engineering's Receive Four-Square antenna
- Combine two receiving antennas to create a directional pattern
- The NCC-1 enables you to adjust the antenna array pattern as if you were moving the antennas
- Use for direction finding

Special Features

- Exceptional Dynamic Range, nearly 1000 times better than nearest competitor
- Phasing is voltage controlled allowing precise resetting of phase
- Phasing rotates more than 360 degrees with smooth control
- Built-in two channel voltage controlled attenuator system
- Low noise, high dynamic range amplifiers
- Vastly superior dual channel complementary phasing system
- Very low noise floor
- Separate controls for reversing channel and phase
- Works on all modes, 300 kHz to 30 MHz
- Provides power for external active antennas
- Input for mute on transmit

DXE-TVSU-1A - Time Variable Sequencer Unit

The **TVSU-1A Time Variable Sequencer Unit** is a microprocessor-based transmit / receive control-signal delay unit. It provides 0-30 ms of delay, programmable in 2 ms increments, to as many as five outputs tied to the CW keying or push-to-talk (PTT) lines. By controlling the receive-to-transmit (and back) timing of linear amplifiers, preamplifiers, and other sensitive equipment, damage caused by improper switching can be eliminated. This sequencer improves CW performance by eliminating annoying leading edge chopping or truncating of Morse characters. This is especially important in contests or pileups where sending accuracy is critical. The TVSU can also control external devices such as preamps, active antennas, or external relays that need to have power removed during transmit. Separate power-in and power-out jacks on the front panel are used to control external power in this type of application. Two 2.1 mm power plugs and two 3.5 mm stereo plugs are provided.



Benefits

- Control timing of PTT turn-on, hang delay of PTT, amplifier hang delay, external antenna relay hang delay and turn-on delay of auxiliary output
- Dip switch settable delays of 0-30 milliseconds in 2 millisecond steps
- Side tone generator that follows input of keyer or hand key not transmitter
- Side tone pitch can be programmed from 300 to 1000 Hz in 50 Hz steps, front panel headphone jack with adjustable volume
- Supports CW full break in
- Can control external power to our Active Receive Antennas and permit operation in closer proximity to transmit antennas

DXE-RSC-2 - Two-port Splitter/Combiner

Use the DX Engineering RSC-2 to combine two receiving antennas to form an array or to split the signal from an antenna to feed two receivers. The RCS-2 reduces problems and performance shortfalls caused by impedance errors in less-than-perfect antenna systems.

- Metal housing for superior shielding and longer life
- High quality components
- Internal spark gaps and large ground planes for improved lightning protection
- Reliable CATV F connectors standard
- Broad, 0.3 to 30 MHz operating range with 75 Ω systems
- Economical solution to potential impedance errors



DXE-RFCC-1 - Receive Feedline Current Choke, 50 to 75 Ohm 300 kHz to 30 MHz

If you wish to reduce feedline radiation and improve reception, a Feedline Current Choke is recommended if your SWR is already low. Adding a DX Engineering Feedline Current Choke at the point where the feedline exits the area of the antenna will substantially reduce unwanted feedline radiation or reception without the need for improved station grounding.

The advantages of using an FCC:

- Prevents unwanted RFI by eliminating feedline current and radiation
- All power goes to the antenna, improving efficiency
- Reduces noise or unwanted signals picked-up by the feedline
- Overcome a less than optimal ground system

The DX Engineering RFCC-1 receive feedline common-mode choke is the most effective solution to common-mode noise or unwanted signal ingress available to date. The DX Engineering RFCC provides thousands of ohms isolation between the input and output coaxial shield connections while passing desired signals, including dc or low frequency ac control signals. The RFCC has extremely high isolation impedance which effectively blocks common-mode noise or unwanted signals, even in the presence of very poor grounding. Low noise receive antennas are traditionally located away from electrical wiring and other noise sources. Unfortunately, noise and other unwanted signals have a direct path to your low-noise antenna through the feedline shield connections between the station equipment and antenna. Unwanted signals can also energize the outside of the feedline shield, and this undesired signal energy can be conducted directly to the receiving antenna. This can reduce antenna directivity. Unless you have a perfect zero-resistance RF ground at the antenna, some of the common-mode noise or unwanted signals from the feedline shield will make it into the antenna. The RFCC is effective from 300 kHz to 30 MHz. It comes with standard CATV type "F" female connectors, although it can be used in any 50 to 75 ohm receiving system. The RFCC is a passive device, therefore requires no power to operate



RG-8/U Foam Coax Assemblies

These DX Engineering cable assemblies use high quality Belden 8214/RG-8/U Foam dielectric coaxial cable and include Silver Teflon PL-259 (UHF) connectors installed at each end. RG-8/U cable is protected by a PVC jacket and is normally recommended for indoor applications - or protected areas where ultraviolet contamination is unlikely to occur. When comparison shopping, note that RG-8/U is no longer a government MIL-spec cable - leaving it open to interpretation by many manufacturers. When in doubt, use RG-213/U with a non-contaminating PVC jacket for longest life in most outdoor applications. The coax has a flexible 11 gauge stranded copper center, foamed Poly dielectric, 97% coverage bare copper shield and a black PVC jacket. The PL-259 connector is silver plated with a silver plated center conductor. Connectors are soldered rather than crimped and an adhesive lined shrink tubing is used to form a weather-resistant bond between the connector body and the coax. Each assembly is then 100% Hi-Pot tested to guarantee a quality cable assembly you can count on.



Custom Lengths Available, Call DX Engineering for Details

DXE Part #	Part Name
DXE-CBC-008U002	Coax Cable, RG-8/U, UHF connectors, 2 feet for BTV DCF kit
DXE-CBC-008U003	Coax Cable, RG-8/U, UHF connectors, 3 feet
DXE-CBC-008U006	Coax Cable, RG-8/U, UHF connectors, 6 feet
DXE-CBC-008U012	Coax Cable, RG-8/U, UHF connectors, 12 feet

RG-213/U Coax Assemblies

These DX Engineering cable assemblies use high quality Belden 8267/RG-213/U coaxial cable and include Silver/Teflon PL-259 (UHF) or male N connectors installed at each end. RG-213/U cable is protected by a non-contaminating PVC jacket and is normally recommended for both indoor and outdoor applications. The UV stabilized jacket assures long life where ultraviolet contamination is a concern. Covered by a government MIL-spec (MIL-C-17, M17/163-00001), you can always be sure of getting the highest quality cable. The coax has a flexible 13 gauge stranded copper center, Poly dielectric, 96% coverage bare copper shield and a non –contaminating PVC jacket. The PL-259 connector is Silver/Teflon with a silver plated center conductor. The N connector is Silver/Teflon with a gold center conductor. Connectors are soldered rather than crimped and an adhesive lined shrink tubing is used to form a weather-resistant bond between the connector body and the coax. Each assembly is then 100% Hi-Pot tested to guarantee a quality cable assembly you can count on.



Custom Lengths Available, Call DX Engineering for Details

DXE Part #	Part Name
DXE-CBC-213U3	Coax Cable Assembly, RG-213/U Coax, with PL-259 Connectors, 3ft.
DXE-CBC-213U6	Coax Cable Assembly, RG-213/U Coax, PL-259 Connectors at each end, 6ft.
DXE-CBC-213U12	Coax Cable Assembly, RG-213/U Coax, with PL-259 Connectors, 12ft.
DXE-CBC-213U25	Coax Assembly, RG-213/U Coax, WITH PL-259 Connectors, 25ft.

RG-8/X Coax Assemblies

These DX Engineering cable assemblies use high quality Belden 9258/RG-8/X coaxial cable and include Silver/Teflon PL-259 (UHF) or male N connectors with silver plated reducers installed at each end. The coax features a flexible 16 gauge stranded copper center, Foam/Poly dielectric, 95% coverage bare copper shield and a PVC jacket. The PL-259 connector is Silver/Teflon with a silver plated center conductor. The N connector is Silver/Teflon with a gold center conductor. Connectors are soldered rather than crimped and an adhesive lined shrink tubing is used to form a weather-resistant bond between the connector body and the coax. Each assembly is then 100% Hi-Pot tested to guarantee a quality cable assembly you can count on.



Custom Lengths Available, Call DX Engineering for Details

DXE Part #	Part Name
DXE-CBC-8XU2	Coax Cable, RG-8/X, with PL-259 ends, 2 ft.
DXE-CBC-8XU3	Coax Cable, Belden RG-8/X, PL-259 Connectors, 3ft.
DXE-CBC-8XU6	Coax Cable, Belden RG-8/X Coax, with PL-259 Connectors - 6ft.
DXE-CBC-8XU12	Coax Cable, Belden RG-8/X, with PL-259 Connectors - 12ft.
DXE-CBC-8XU25	Coax Cable, Belden RG-8/X, with PL-259 Connectors - 25ft.

50 Ohm Coax Cable Prep Tools

The UT-8213 simplifies the preparation of RG-8 or RG-213 coax to accept PL-259 UHF style or 2-piece Type N connectors. The UT-808X is specifically designed for stripping RG-8X/Belden 9258 cable. The CNL-911 cutters have specially designed blades to cut the cable without crushing it - leaving the end cleanly cut and ready for stripping and connector assembly. The UT-80P or UT-80N allow mechanical assembly of the PL-259 or 2-piece Type N connector body to the cable without shredding it with pliers. All DX Engineering Cable Prep Tools are designed and selected to provide better results, with greater ease of use.



DXE Part #	Part Name
DXE-UT-8213	Coax Cable Stripper for RG-213, RG-8, 9913F7, LMR-400 etc.
DXE-UT-808X	Coax Cable Stripper for RG-8X, Belden 9258, LMR-240
DXE-UT-RB-HD	Premium Replacement Blades for DX Engineering and Cablematic Strippers
DXE-UT-80P	Connector Assembly Tool for PL-259/RG-213-size Cable
DXE-CNL-911	Coax Cable Cutter
DXE-170M	Precision Shear Side Cutters

DXE-F6 - 75 Ohm F-6 Style, Direct Bury Coaxial Cable: Full Spool or Custom Cable Assemblies

DX Engineering recommends using a high quality 75 Ω “flooded” F6 type coaxial cable. Flooded style cables have the distinct advantage of automatically sealing small accidental cuts or lacerations of the jacket. Flooding also prevents shield contamination and can be direct-buried. This low-loss cable features dual shields and an 85% Velocity Factor.

Custom cable assemblies available, Call DX Engineering for details.



DXE-CPT-659 - Coax Cable Stripper for CATV F-6, RG-6 and RG-59 coaxial cable.

Coax Cable Stripper for CATV F-6, RG-6 and RG-59 coaxial cable.

Includes 1 Replacement Blade - DXE-CPT-659

Prepares CATV F-6, RG-6 and RG-59 coaxial cable for the installation of an "F" type connector - One-step cutting motion - Precision cut - No nicks or scratches to conductor



DXE-SNS6-25 - Watertight Coaxial Connector, Snap-N-Seal for CATV F-6 Cable, 25 pieces

Snap-N-Seal is an environmentally sealed CATV F coaxial connector system for harsh environments. The connectors have a unique, 360 degree radial compression system that offers the signal leakage protection required for high performance receive systems.

- Quad sealed system prevents moisture from migrating into the connection
- 360 degree radial compression provides superior RF integrity (-95dB typical, 60% bonded foil cable)
- Easy cable preparation
- Connector to cable retention of 40 lbs minimum
- Superb impedance match to 1 GHz
- Manufactured of high quality 360 brass, cadmium plated with yellow chromate coating for maximum corrosion resistance
- UV-resistant plastic and O-rings provide a reliable environmentally sealed connector



An installation tool, such as the **DXE-SNS-CT1** is required to install the connectors. Normal crimping tools or pliers will not work.

DXE-SNS-CT1 - Compression Tool for Snap-N-Seal 75 Ohm Coaxial Connectors

Ratchet compression tool for installing **DXE-SNS6** Snap-N-Seal coaxial connectors. Ordinary pliers will not install these connectors properly.



Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at:

DXEngineering@DXEngineering.com

For best service, please take a few minutes to review this manual before you call.

Warranty

All products manufactured by DX Engineering are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. DX Engineering's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by DX Engineering. If DX Engineering's products are claimed to be defective in material or workmanship, DX Engineering shall, upon prompt notice thereof, issue shipping instructions for return to DX Engineering (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's specifications. In addition, DX Engineering's warranties do not extend to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to DX Engineering. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR DX ENGINEERING ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

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DX Engineering **DXE-RTR-1** Receive Antenna Interface for Transceivers - *Patent Pending*