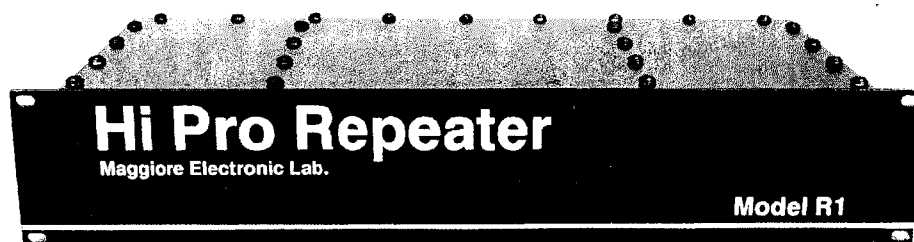


MAGGIORE ELECTRONIC LABORATORY

Hi Pro **OPERATING AND MAINTENANCE** **MANUAL**



Hi Pro "R1" REPEATER

DESCRIPTION

The **Hi Pro "R1"** is an extremely rugged completely solid state repeater designed for continuous operation.

State of the art devices are engineered into tight knit straightforward electronic design throughout both transmitter and receiver. Reliable, low current demand, compactness, unexcelled performance and ease of operation are the net result.

The dual conversion receiver with its FET front end and extremely high-Q circuits boast low noise and sensitivity of better than 0.2 uv or less. Signal gain of 90 db or more is accomplished from the IF amplifier along with a very low noise floor. Regulated oscillators, amplifiers and squelch circuits produce unmatched stability. Audio reproduction is of an unusually high order of distortion free clarity. Advanced squelch prevents chopping most prevalent in other repeater systems. The overall result is a receiver well suited for harsh RF environment.

The transmitter section produces a very clean, stable signal, designed for continuous operation. A well regulated crystal oscillator and audio amplifier is employed for initial frequency stability along with well selected components insure a high degree of stability. High-Q RF shielded stages provide minimum interstage spurious reaction and maximum isolation. A low pass filter is placed at the output to further insure undesirable frequency products not being emitted. The excellent audio characteristics from the receiver are carried over to the transmitter and passed on and rebroadcast to the antenna.

The **Hi Pro "R1"** is constructed in a series of modules which are easily removable for servicing. The design lends it self to interfacing with other equipment. Placement of components were carefully selected to insure cool operation and efficient operation.

A modern style, small size and low profile compliment the whole repeater system.

SECTION 1 INSTALLATION

1.1 Unpacking.

Carefully remove your Repeater from the packing carton and examine it for signs of shipping damage. Should any shipping damage be apparent, notify the delivering carrier immediately, stating the full extent of the damage. It is recommended you keep the shipping carton and all packaging in the event the carrier may want to examine them in addition to storage, moving, or reshipment becomes necessary.

1.2 Location.

Placement of the Repeater is not very critical and should be governed by convenience and accessibility. Since the unit is so compact, many possibilities present themselves. BE SURE TO PROVIDE PLENTY OF VENTILATION BOTH ABOVE AND BELOW THE REPEATER. A FAN MOUNTED IN THE REAR OF THE REPEATER WITH AIR FLOW DIRECTED TOWARD THE HEAT SINKS WOULD BE ADVANTAGEOUS, BUT NOT NECESSARY IF TEMPERATURES REMAIN BELOW 100° FARENHEIT.

1.3 Power Requirements.

The "R1" Repeater is not supplied with a 110v AC 60cy power supply. A 13.8 volt DC, negative ground system capable of at least 5 amps is required. The "R1" can be ordered with a separate AC power supply. The low current draw is ideal for use in a remote solar power system. Some precautions must be taken however to the condition of the electrical system. Items such as low battery, poor voltage regulation, etc., will impair operation of your repeater system.

- 1.3 High noise generation or low power output and hum can usually be traced to a power source deficiency. Low voltage while under load will not produce satisfactory results from your Repeater system and performance will be greatly impaired.

CAUTION: Excessive voltage (above 130 / 240v AC - 15v DC) will cause damage to your repeater. Be sure to check the source voltage before connecting any power to your repeater. Do not defeat ground pin on the power cord. Always Use A Grounded Outlet.

1.4 Antenna.

The most important single item that will influence the performance of any communication system is the antenna. For that reason, a good high quality gain antenna of 50 ohms impedance is recommended. The antenna should be free from mechanical joints and clamps to reduce the possibility of poor connections generating noise in the system. When adjusting your antenna, by all means, follow the manufacturer's instructions. There are some pitfalls to avoid. For example, do not attempt to adjust an antenna for lowest VSWR with the repeater transmitter. NEVER try any adjustments while connected to the duplexer. Rather use a low power transmitter and an in line watt meter similar to the Bird 43 with the proper connections and slug. Use hardline or double shielded cable and avoid long runs. Avoid using adapters to match cables and connectors on the Repeater, antenna or duplexers.

SECTION 2 OPERATION

2.1 Initial Preparations.

- a. Connect the antennas or duplexer cables to the Repeater coaxial connectors. Make sure the coax are the right impedance of 50 ohms and that connectors are well soldered, tight and not shorted.
- b. Make sure the power switch is in the off position. This prevents the transmitter from being keyed up in the repeat mode.
- c. If an auto patch is to be used then connect the phone line at this time.
- d. Connect to a proper power source.
- e. **Do not adjust the volume or squelch** control located inside of the repeater. These two controls are preset at the factory. Readjusting these controls will adversely effect the overall operation of the system.

2.2 Operation.

Switch on the power by pushing down on the switch located on the rear panel. panel.

2.3 Reception.

- a. A optional speaker can be attached to feed thru "B" located inside the center compartment of the Repeater. A adjustable "T" pad will be necessary to control the volume. DO NOT adjust the master volume control on the receiver board as this will upset all repeat and auto patch audio levels.
- b. The squelch control on receiver board has been set at the factory and should not require any further adjustment.

2.4 Transmitting.

- a. The transmitter power output has been set at the factory and should not be increased. Little benefit would be realized and the increase in power may result in premature failure of the power amplifier.
- b. In the event that you may want to decrease the output of the power amplifier, a control on the exciter board has been provided. The maximum decrease in power should not exceed one third of maximum power output. This will insure maximum stability of the amplifier.

SECTION 3 MAINTENANCE.

- 3.1 The necessity of completely realigning the repeater is unlikely. The most common cause of breakdown is component failure due to lightning strikes. It is felt that the average owner would not have the necessary equipment or facilities to accomplish realignment in any case. If in the event it is necessary we do provide pertinent instruction to realignment.

Great care and precision are employed in its manufacture and warranty service is provided to insure that it meets specifications. Adjustments not outlined herein should not be undertaken unless the owner is skilled as a technician.

- 3.2 Transmitter Crystal Alignment.
- Connect a 50 ohm dummy load to the transmitter output of the repeater.
 - Key the repeater transmitter and slowly adjust the trimmer capacitor located next to the transmitter crystal, until the desired frequency is achieved. Do not attempt to do this without a proper high quality frequency monitor.
- 3.3 Receiver Crystal Alignment.
- Place Repeater in simplex mode.
 - Connect test oscillator to the receiver coaxial connector and set to the proper receiver frequency.
 - Slowly adjust the trimmer capacitor located next to the receiver crystal, until the desired frequency is achieved.
- 3.4 For information on controller operation refer to the controller manual.

SAFETY INSTRUCTIONS

- 1 READ ALL THE INSTRUCTIONS BEFORE OPERATING THE EQUIPMENT.
- 2 RETAIN ALL INSTRUCTIONS AFTER READING FOR FUTURE REFERENCE.
- 3 HEED WARNINGS IN THE OPERATING INSTRUCTIONS.
- 4 DO NOT PLACE EQUIPMENT NEAR OR IN WATER OR MOISTURE OR CLOSE TO CONTAINERS THAT MAY SPLASH ONTO THE EQUIPMENT.
- 5 REPEATER SHOULD NOT BE PLACED ON OR NEAR ANY HOT EQUIPMENT.
- 6 ONLY USE POWER SOURCES RECOMMENDED BY THE MANUFACTURER.
- 7 POWER CORDS SHOULD BE ROUTED SO THAT THEY ARE NOT LIKELY TO BE CRUSHED OR PINCHED BY ITEMS PLACED UPON OR AGAINST THEM. PAY PARTICULAR ATTENTION TO CORDS AND THERE CONDITION AND KEEP AWAY FROM HEAT AND FLAME.
- 8 CARE SHOULD BE TAKEN TO PREVENT OBJECTS AND LIQUIDS FROM FALLING OR SPILLING INTO THE ENCLOSURE.
- 9 DAMAGE REQUIRING SERVICE.
 - A. THE POWER SUPPLY OR PROTECTION CIRCUITS ARE DAMAGED.
 - B. LIQUIDS OR OBJECTS ENTERING THE CABINET.
 - C. EQUIPMENT DOES NOT APPEAR TO OPERATE NORMALLY OR EXHIBITS MARKED CHANGE IN PERFORMANCE.
 - D. THE ENCLOSURE HAS BEEN DAMAGED.
- 10 THE USER SHOULD NOT ATTEMPT TO SERVICE THE EQUIPMENT. REFER ALL REPAIRS TO A QUALIFIED TECHNICIAN.

FEED THRU IDENTIFICATION

"A" +13.8 VDC

"B" RECEIVER HIGH LEVEL AUDIO

"C" RECEIVER C.O.S.

"D" SPARE

"E" TRANSMIT HIGH LEVEL AUDIO INPUT

"F" SPARE

"G" KEYING (switched 13.8 VDC)

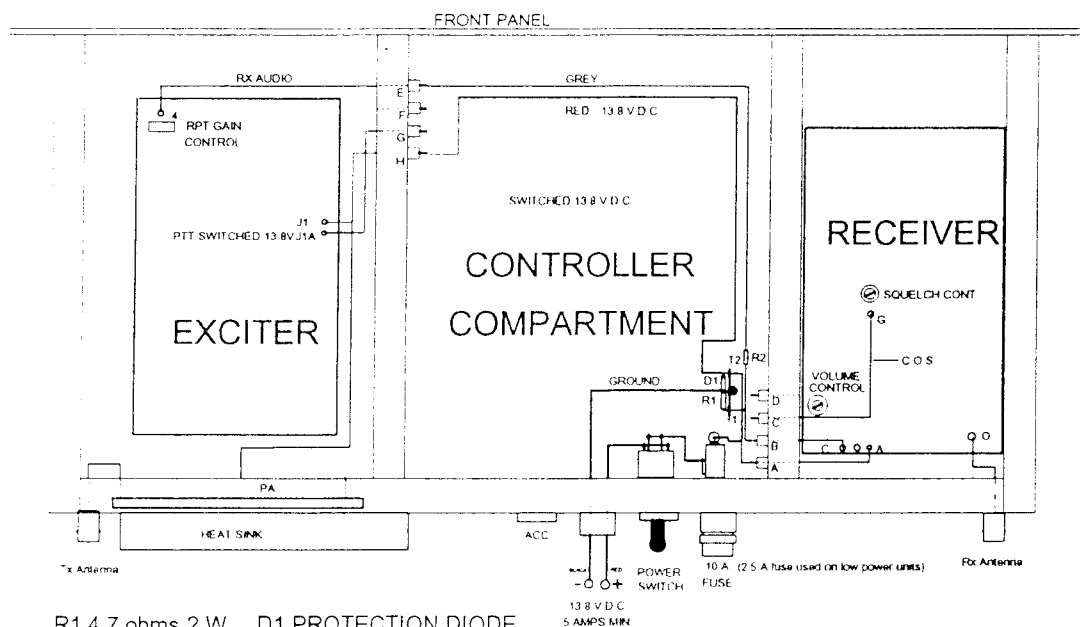
"H" 13.8 VDC SUPPLY

A 1/2" FEED THRU GROMET IS SUPPLIED ON REAR OF REPEATER FOR CONNECTIONS TO EXTERNAL ACCESSORIES.

USE A WELL FILTERED 13.8 VDC, 5 AMP OR BETTER SUPPLY.

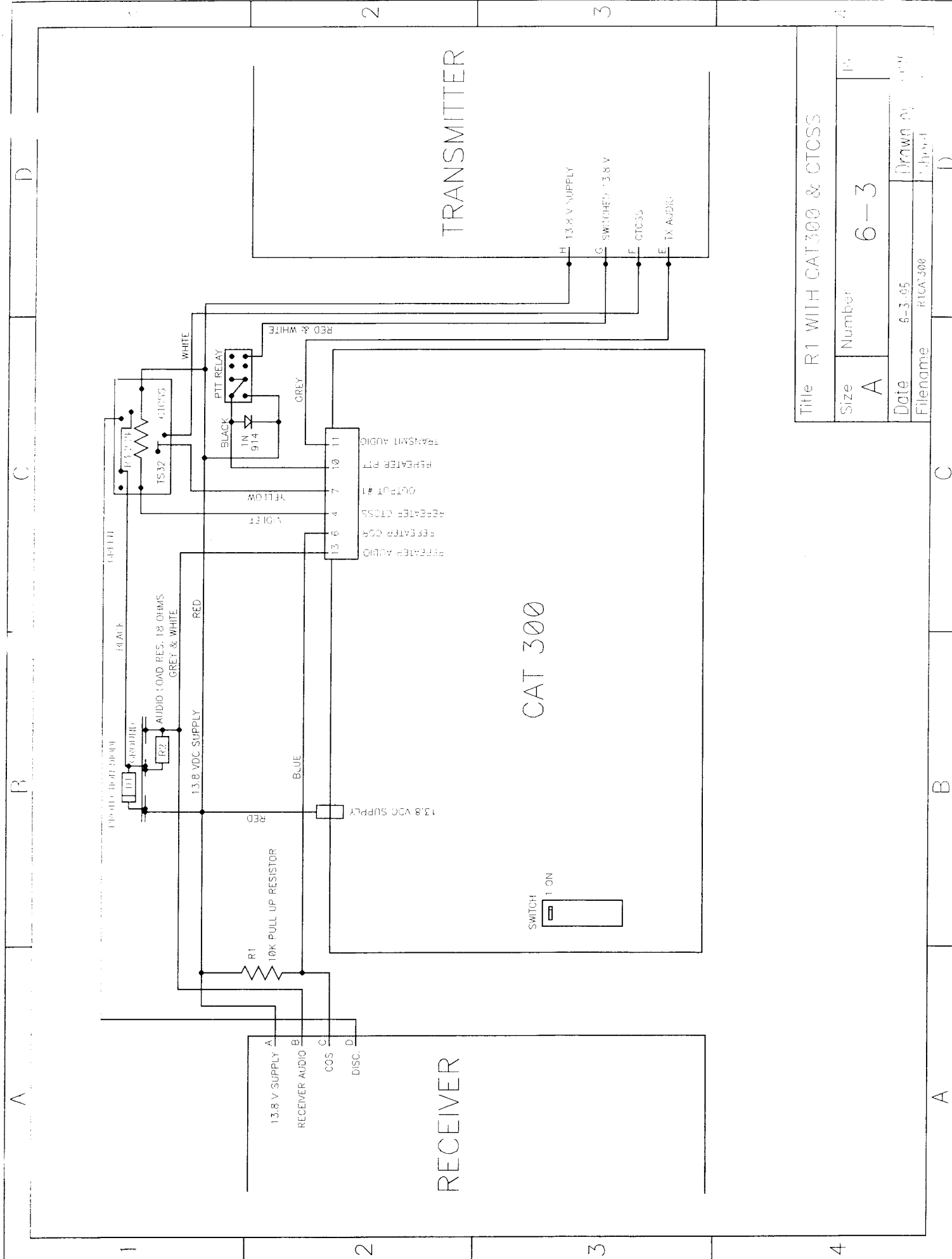
FANS OR HEATERS ARE NOT REQUIRED UNLESS SUBJECTED TO EXTREME HEAT OR COLD.

A FUSE AND REVERSE VOLTAGE PROTECTION IS PROVIDED.

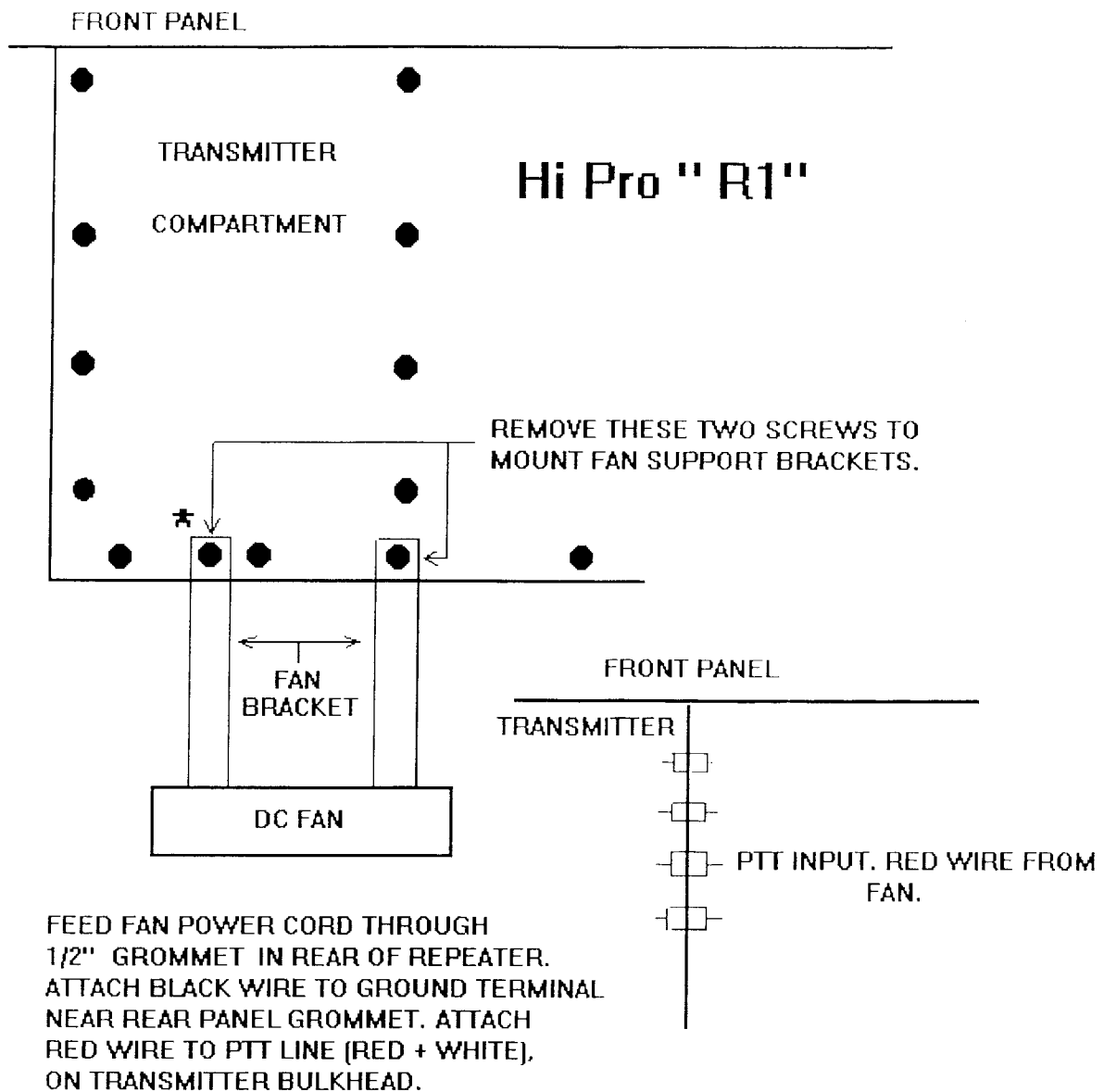


R1 4.7 ohms 2 W D1 PROTECTION DIODE

R2 4.7 k 1/4 W



Title R1 WITH CAT300 & CTCSS			
Size	Number	6-3	
Date	8-3-95	Drawn by	
Filename	R1CAT300	App'd	



DC FAN INSTRUCTIONS.

★ PLEASE NOTE: SOME "R1" REPEATERS WILL REQUIRE DRILLING A 1/16" HOLE.