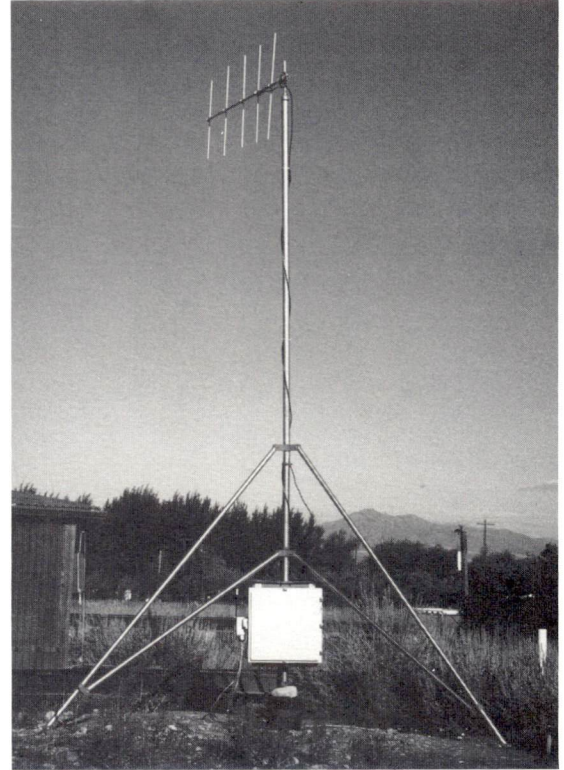
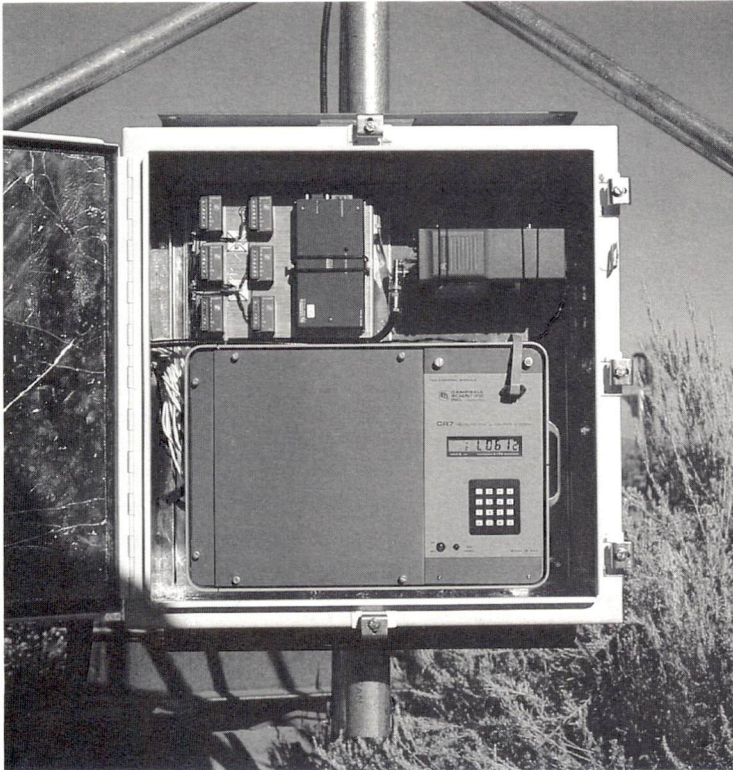


DC95 RF MODEM

For Data Retrieval From
Campbell Scientific Data Acquisition Equipment



The DC95 RF Modem converts digital data to an audio signal that can be transmitted over voice grade radio. The name *RF Modem* comes from *Radio Frequency MODulator/DEMulator*.

The DC95 codes all transmissions for specific communication paths. Up to 255 stations are accessible on a single frequency. Any station can be used as a repeater to extend the range of a network.

Five watt UHF or VHF transceivers and good quality antennas (with a combined gain of about 5db) provide excellent communication reliability for a line of sight range of 20 to 25 miles between stations.

Campbell Scientific sells Motorola HT90-5

transceivers pre-wired for direct connection to the DC95 RF Modem. Other transceivers require installation of a special cable to connect the transceiver to the RF Modem.

The transceiver is connected to the DC95 RF Modem and a 12 volt power source. Power for the RF Modem is supplied by the datalogger. A station functioning only as a repeater (no datalogger) requires the PS35 power supply to provide 12 volts for the radio and 5 volts for the RF Modem.

The DC95 RF Modem is compatible with the 21X and CR7 (with 700X Control Module) dataloggers.



CAMPBELL SCIENTIFIC, INC.

P.O. Box 551 • Logan, Utah 84321 • (801) 753-2342 • TLX 453058

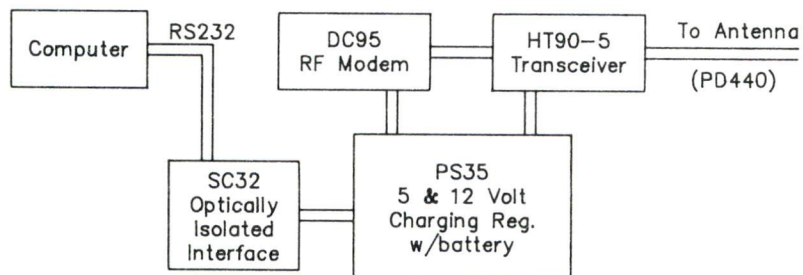
BASE STATION USING A COMPUTER OR TERMINAL

The Campbell Scientific PC201 card for the IBM PC or compatible computer connects to the RF Modem with the SC209 cable. A separate 12 volt power supply is required for the HT-90 transceiver. Any other computer or terminal with an RS232 interface can be used with the DC95 RF Modem and a transceiver for communication with remote dataloggers. The RS232

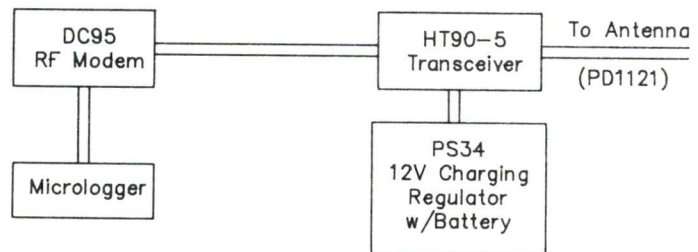
connector from the computer or terminal connects to the DC95 via the SC32 optically isolated interface.

The PC205 software for IBM PC's and compatible computers enables the PC to automatically collect data from a network of dataloggers via telephone, direct lines, RF transceivers or any combination of these.

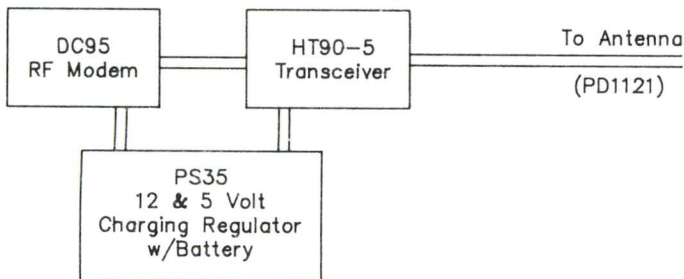
Base Station with a Computer



Field Station



Repeater Only



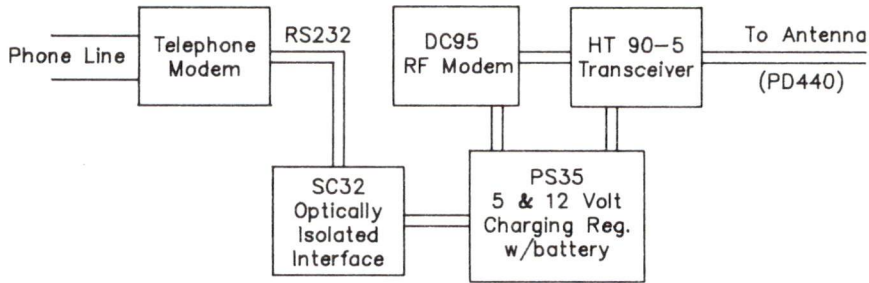
BASE STATION ON A TELEPHONE LINE

The RF Modem can be connected to a telephone modem. This allows long distance access to an RF network. If the Campbell Scientific DC103A telephone modem is used, the PS35 power supply is required to provide the 5 volts for the RF Modem and the DC103A modem. If another RS232 modem is used, the SC32

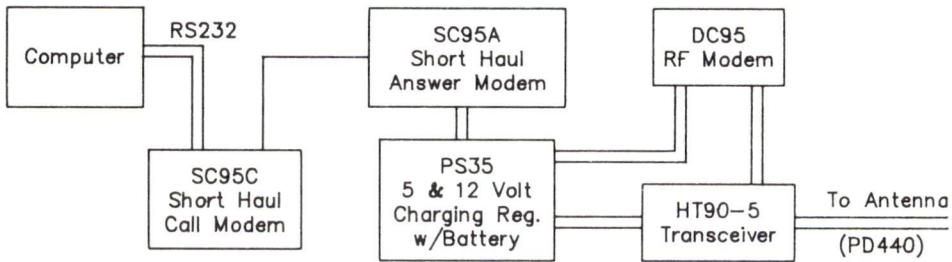
optically isolated interface and the PS35 power supply provide the connection to the 9 pin connector on the DC95.

Any computer or terminal with a telephone modem can call the base station and set up the radio communication path.

Base Station on a Phone Line



Base Station on a Short Haul Modem



EFFECTS OF TRANSMISSION ERRORS

The PC201 software uses an error checking signature to verify that data has been correctly transferred. If errors occur, the invalid data is discarded and the original data retransmitted until it is correctly received.

Data are transmitted in blocks each having a maximum transmission time of 1 second. Typical command

sequences take about .25 seconds. If a response isn't received within 1.5 seconds of the time a command was sent, the transmission was interrupted and has to be repeated. The delay is increased by 1.5 seconds for each repeater in the path.

SPECIFICATIONS

DC95 RF MODEM

DATA THROUGHPUT: With a 1200 baud rate between the computer and the DC95, and with no repeaters, the throughput is about 60 bytes per second or 30 values per second when data is transferred in binary format. With one repeater in the path, it is about 45 bytes per second. Throughput includes the time required for a computer to request data a block at a time.

NUMBER OF STATIONS ON ONE FREQUENCY: 255

CONNECTORS: A 9 pin D type connector for power and serial data communication and a 10 pin rectangular connector to the transceiver for controls and signals.

POWER REQUIREMENTS:

Supply voltage: 5 volts DC

Quiescent Current Drain: 200 microamps

Active Current Drain: 20 milliamps

OPERATING TEMPERATURE RANGE: -40 to +80°C

SIZE: 6.5" x 3.5" x 1.2" Connectors extend 0.6" beyond the 6.5" dimension.

WEIGHT: 0.7 lbs

HT90-5 Motorola Transceiver

POWER REQUIREMENTS:

Supply voltage: 12 volts DC

Quiescent current drain: 13 milliamps

Current drain while transmitting: 1 amp

Operating temperature range: -30 to +60°C

SIZE: 7.26" x 2.70" x 1.95"

FREQUENCY RANGE: 136 - 174 MHz



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