

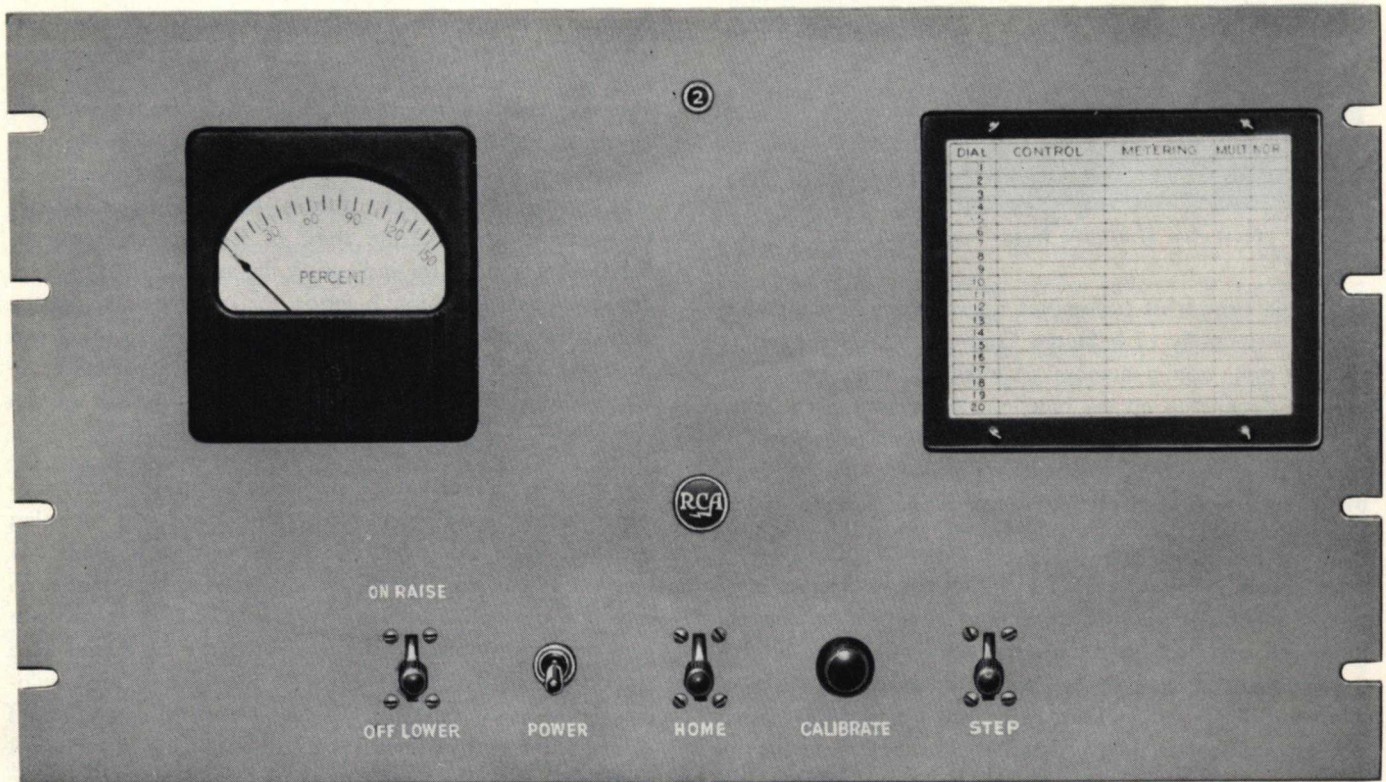


# Remote Control Systems

TYPES BTR-11B/20B

CATALOG

B.6602



## FEATURES

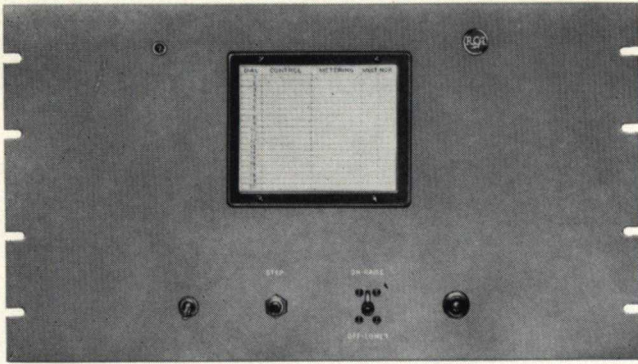
- Flexible systems at minimum cost
- Provisions for checking metering circuit calibration at control point
- Operates without vacuum tubes, amplifiers, oscillators or tuned circuits
- Lowest telephone line rental and lowest power consumption
- Easy accessibility to all terminal connections and components
- Home-step provision—rapid homing
- Provides fail-safe circuit
- D-C system operates on proven dial telephone principles

## DESCRIPTION

The RCA Type BTR-11B and BTR-20B Remote Control Systems are designed for use with AM, FM or TV broadcast transmitter equipment to remotely control the operation of the station transmitter and associated equipment. With these units AM and FM stations now can be operated entirely from the broadcast studio or other remote point without the presence of an engineer at the transmitter site.

The Type BTR-11B Remote Control System provides control or measurement facilities of all essential transmitter functions. Up to ten functions such as transmitter on-off, plate on-off, overload reset, power output, tower lights, Conelrad provisions may be controlled. Metering of filament voltage, plate voltage, plate current, antenna current from a common point or base points, tower light current, modulation monitor, and frequency monitor may be read by means of the system. The Type BTR-20B Remote Control System is an extended deluxe equipment providing up to 19 control and metering facilities. All essential functions performed by the BTR-11B are provided, plus spare control and metering accommodations. This unit may be used to control a second or standby transmitter if desired.





Front view of BTR-20B Transmitter Control Unit.

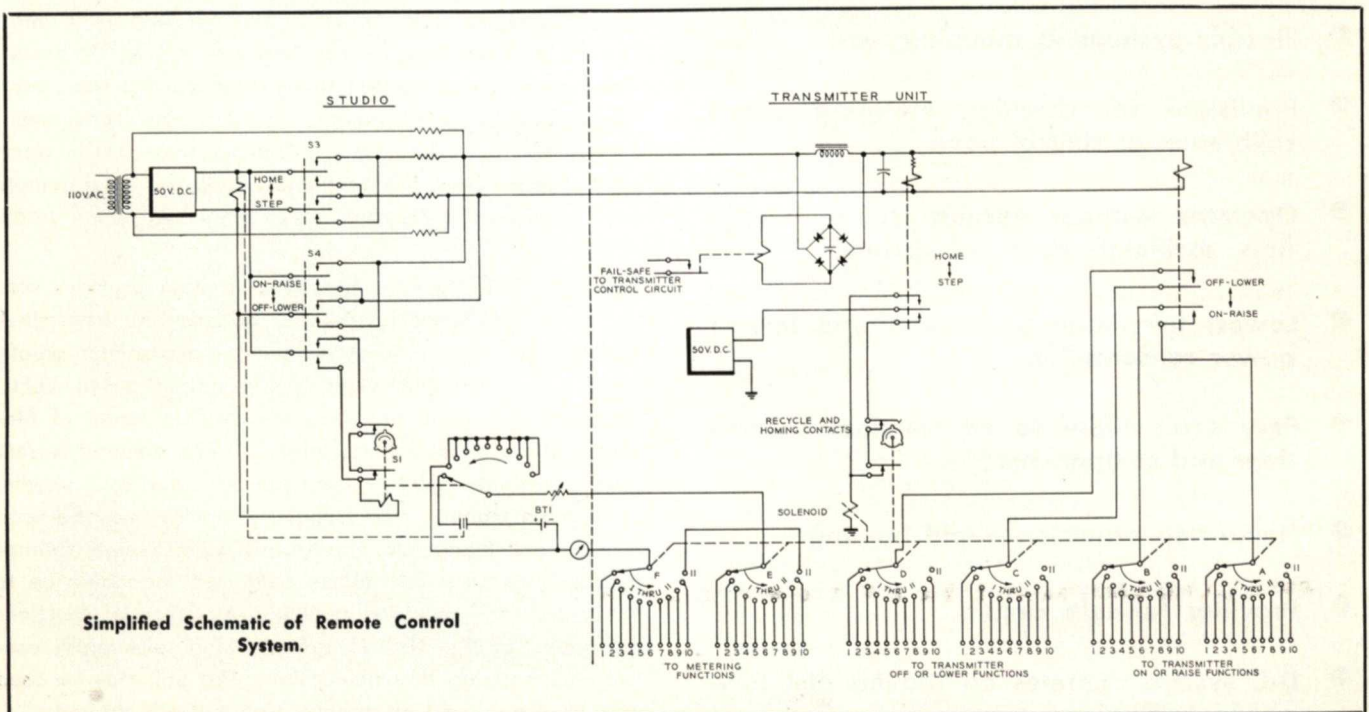
The radio broadcast transmitter remote control equipment consists essentially of a Studio Control Unit, a Transmitter Control Unit, and a number of auxiliary units, the exact number depending on the functions to be controlled. With this equipment it is possible to control and/or measure the operation of up to 10 transmitter functions with the Type BTR-11B Remote Control System, or 19 functions with the BTR-20B equipment.

The Typical Metering and Control Functions Tables contain a sample list of the transmitter circuits that can be measured and the operations that can be controlled by the Studio Control Unit at the remote location via two telephone lines with a loop resistance up to 5000 ohms. The Studio Control Unit is designed for rack mounting at the studio location; while the Transmitter Control Unit and most of the auxiliary equipment is housed at the transmitter site.

The Studio Control Unit has the following front panel controls: "home-step" switch, "on-raise-off-lower" switch, power switch, indicator lamp, meter, and function indicator dial. The Transmitter Control Unit of the BTR-11B and BTR-20B systems have a power switch, indicator lamp, function indicator dial, step switch, and "on-raise-off-lower" switch to facilitate local set-up or test operations.

Stepping switches located in both studio and transmitter units, are rotated to the desired position by operating the "home-step" switch to the step position. Each operation of the "home-step" switch rotates the stepping switches position. Attached to the shaft of the stepping switches are indicator dials for indicating the position of the stepping switches. Provision is made for rapid homing of the system by operating the "home-step" switch to the home position. After the desired function has been selected, the required operation can be performed by means of the "on-raise-off-lower" switch.

It is possible to read on the studio meter any desired transmitter meter reading in any position of the stepping switches. With the addition of the accessory, MI-27541 Meter Commutator, up to six readings can be made on any one position of the BTR-11B or BTR-20B. Means are provided for calibrating the line resistance by means of a standard cell. A fail-safe circuit is provided in the equipment systems to meet all FCC requirements. In the event of a failure of the remote control system or the control telephone lines, the transmitter is automatically shut down. Both studio and transmitter units have self-contained power supplies. The remote control systems require the use of two





"signal service" telephone pairs. In-as-much as these lines carry only d-c they can be rented at a minimum rate.

A number of auxiliary equipments are available to expand the facilities or to make more flexible the operation of RCA Remote Control Systems. Chief among these accessories is the Type BTRX-40A Remote Control Extension Unit designed for operation with the BTR-20B. This unit is very similar in appearance and size to the Transmitter Control Unit of the BTR-20B. By dialing a prearranged position on the Studio Control Unit, the BTRX-40A is automatically coupled into the circuit and up to 19 additional points of control and/or metering are available. If so desired, more than one BTRX-40A can be coupled to the BTR-20B; each extension unit providing additional 19 control and 19 meter reading points.

Remote R-F Pickup, MI-28027-A, provides the means of observing the antenna current at the studio control unit. The pickup coil is coupled to the antenna lead where it absorbs a sample of the transmitter r-f output. A diode rectifier provides d-c to operate the meter in the Studio Control Unit. A pickup can be installed at a common point to register the combined current of all the antennas. It can also be installed at the individual antennas to register the current of each antenna. It is satisfactory for use with all transmitters up to and including 50 kw. Remote R-F Pick-up, MI-27966, is similar to the above but is rated only for 5 kw transmitters or a total current of 20 amperes.

Meter Panel (AM Monitoring), ES-27220, provides the means of monitoring the output frequency and modulation of an AM transmitter from the remote location. The studio control unit has provisions for connecting the meter panel to the meter circuit of the stepping switch. The unit contains a separate frequency meter and modulation meter mounted on a standard 19-inch panel. It includes a step-down transformer to supply voltage for illuminating the meter lamps.

A-C Voltage Pickup, MI-27516, is installed at the transmitter and is connected to the transmitter control unit metering section. It provides an indication of the transmitter filament bus or line voltage on the studio control meter.

Tower Lighting Monitoring and Control Unit, MI-27519, may be connected to the transmitter antenna tower lighting circuit to provide both the metering and control connections to the transmitter control unit. It provides d-c voltage to the studio control meter for indicating tower light current and has a relay control circuit which enables the antenna tower lights to be turned on and off from the studio control unit.

Tower Lighting Unit, MI-27544, is similar to the above in that it will measure antenna lighting current up to 20 amperes. It does not incorporate switching for control purposes and is recommended in instances where a photocell or other means are used to control the lighting circuits.

Temperature Indicators, MI-27550-1 and MI-27550-2, permit temperature readings from  $-30$  to  $+150$  degrees F over the remote control system. The MI-27550-1 is designed for indoor use and the MI-27550-2 for outdoor use.

Latching Relay Panel, MI-27509-A, is installed in the transmitting equipment where its function is to turn the transmitter on and off, or other similar function. It contains two relays which perform this control function when activated by the studio control unit. One relay turns the filament supply on or off and the other relay turns the plate voltage on or off.

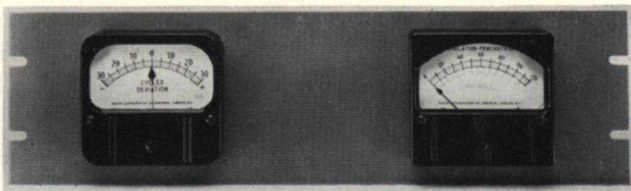
**Typical Control and Metering Functions for AM BTA-5T Transmitter Controlled by BTR-11B Remote Control Unit (1 tower)**

Dial	Control	Metering
1	Transmitter On-Off	Filament Line
2	Plate On-Off	Plate Volts
3	Output Raise-Lower	Antenna Current
4	Overload Reset	Plate Current
5	Tower Lights On-Off	Tower Lighting Current
6		Frequency Deviation
7		% Modulation
8	Spare	
9	Spare	
10	Spare	
11	Home	Calibrate

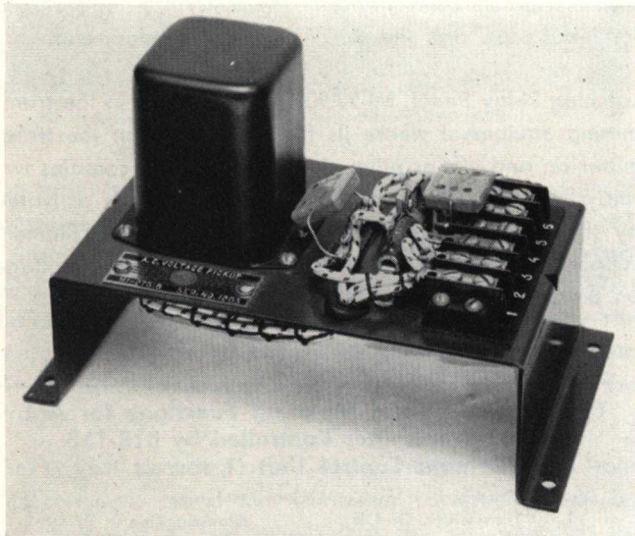
**Typical Control and Metering Function for AM BTA-1R AM Transmitter (3 towers) and BTF-5B FM Transmitter Controlled by BTR-20B Remote Control**

Dial	Control	Metering
1	AM Transmitter On-Off	Filament Line
2	AM Plate On-Off	Plate Volts
3	AM Output Raise-Lower	Common Point Current
4	Overload Reset	Plate Current
5	AM Day-Night	Common Point Current
6		Base Current 1
7		Base Current 2
8		Base Current 3
9		AM Frequency Deviation
10		AM % Modulation
11	Spare	
12	Spare	
13	FM Transmitter On-Off	Filament Line
14	FM Plate On-Off	Plate Volts
15	FM Output Raise-Lower	Reflectometer
16	FM Overload Reset	Plate Current
17		FM Frequency Deviation
18		
19	Tower Lights On-Off	Lighting Current
20	Home	Calibrate

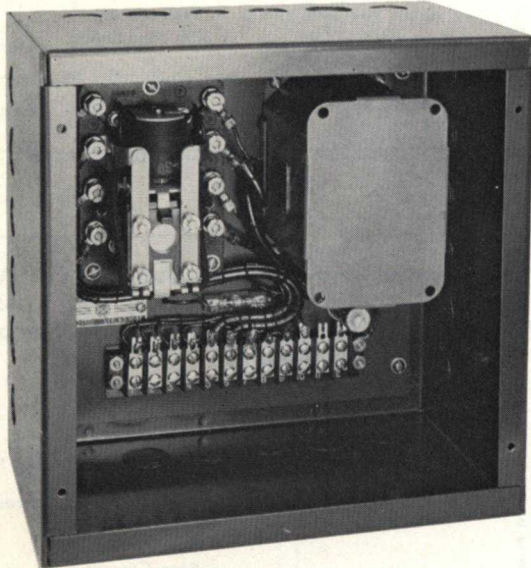




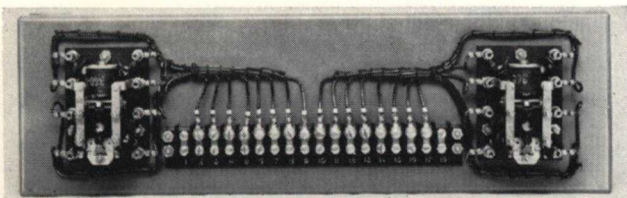
Meter Panel, ES-27220 for AM Monitoring.



A-C Voltage Pickup, MI-27516.



Tower Lighting Unit, MI-27519.



Latching Relay Panel, MI-27509-A.

## SPECIFICATIONS

### Control Functions:

BTR-11B .....	10
BTR-20B .....	19

Power Requirements.....117 volts, a-c, 50/60 cycles

Power Consumption and/or metering.....25 watts maximum

Calibration .....

Meter.....Standard cell

Telephone Line.....0 to 150 per cent (200 microamps)

Fail Safe.....Special d-c; 5000 ohms loop resistance max.

Finish.....Meets FCC requirements

.....Light umber gray

### Dimensions (overall):

BTR-11B Transmitter Control Unit.....19" wide, 10" high, 11" deep

BTR-11B Studio Control Unit.....19" wide, 10" high, 6" deep

BTR-20B Transmitter Control Unit.....19" wide, 10" high, 12 $\frac{7}{8}$ " deep

BTR-20B Studio Control Unit.....19" wide, 10" high, 8 $\frac{7}{8}$ " deep

### Weight (approx.):

BTR-11B Transmitter Control Unit.....18 lbs.

BTR-11B Studio Control Unit.....18 lbs.

BTR-20B Transmitter Control Unit.....20 lbs.

BTR-20B Studio Control Unit.....20 lbs.

## Equipment Supplied

BTR-11B Remote Control System (10 functions) consisting of:

1 Studio Control Unit.....MI-27537

1 Transmitter Control Unit.....MI-27538-A

BTR-20B Remote Control System (19 functions) consisting of:

1 Studio Control Unit.....MI-27539-A

1 Transmitter Control Unit.....MI-27526-A

## Accessory and Optional Equipment

Type BTRX-40A Extension Unit (19 functions).....	MI-27556
2-Meter Panels (AM Monitoring).....	ES-27220
A-C Voltage Pickup.....	MI-27516
Tower Lighting Monitoring and Control Unit.....	MI-27519
Tower Light Monitoring Unit.....	MI-27544
Weatherproof Enclosure for MI-27544.....	MI-27543
Latching Relay Panel (including two relays).....	MI-27509-A
Latching Relay, DPST, 6 amperes.....	MI-27524-1
Latching Relay, DPST, 30 amperes.....	MI-27524-2
Latching Relay, 4DPT, 0.5 ampere.....	MI-27524-3
R-F Relay, 12.5 amperes.....	MI-27545-1
Momentary Relay, DPDT, 15-20 amperes.....	MI-27545-2
R-F Contactor, Latching Type, SPDT, 25 amperes.....	MI-27755-1
R-F Contactor, DPDT, 25 amperes.....	MI-27755-2
Remote R-F Pickup (rated up to 50 kw).....	MI-28027-A
Remote R-F Pickup (rated up to 5 kw).....	MI-27966
Meter Commutator .....	MI-27541
Remote Control Accessory Kit for BTA-50G.....	MI-27687
Remote Control Accessory Kit for BTA-250M.....	MI-27522
Remote Control Accessory Kit for BTA-500MX/1MX.....	MI-27523
Remote Output Control for BTA-5/10H.....	MI-27517
Remote Filament Control for BTA-5/10H.....	MI-27518
Remote Power Cutback Kit for BTA-5/10H.....	MI-27520
Miscellaneous Resistors and Parts for BTA-5/10H.....	MI-27540
Temperature Indicator, Indoor -30°F to +150°F.....	MI-27550-1
Temperature Indicator, Outdoor -30°F to +150°F.....	MI-27550-2
AM Monitor Preampfier.....	108-14A
FM Monitor Preampfier.....	108-15A



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