

# Remote Control System

MODEL TRC-15A



BULLETIN 239C

15 METERING CHANNELS  
30 INDIVIDUAL CONTROL FUNCTIONS



FOR WIRE OR WIRELESS OPERATION

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MOSELEY ASSOCIATES, INC.

A FLDW GENERAL COMPANY

# MODEL TRC-15A for Wire and

## DESCRIPTION

With 15 metering channels and 30 individual control functions, the all SOLID-STATE Model TRC-15A Remote Control System has sufficient versatility to fulfill current requirements and future needs. Flexibility and adaptability are easily obtained with the TRC-15A. Two versions of the TRC-15A Remote Control System are available. These are Models TRC-15AW and TRC-15AR. The only interconnection requirement of the TRC-15AW is any duplex, voice-grade circuit. True wireless remote control can be accomplished with the TRC-15AR. Control subcarrier equipment is standard in this version for multiplexing control information on a Moseley Aural Studio-Transmitter Link. Field conversion to either configuration is possible without rewiring . . . simply exchange the appropriate modules.

The circuitry of the TRC-15A is of **modular construction**, using carefully chosen combinations of integrated circuits and discrete components. The system is noiseless in operation . . . employing no stepper relay. Binary numbers generated by the front-panel push-button assembly of the Studio Unit are encoded to command channel selection. The use of **individual relays** in the Transmitter Unit makes system operation noiseless.

Unique cabinetry provides full access to all circuitry in the TRC-15A. All active circuitry in the Studio Unit is housed in a slide-out drawer assembly. A similar slide-out drawer and swing-away door are used in the Transmitter Unit. See the photographs to the right. Front-panel pulls simplify access. All applicable solid-state devices are socketed.

Several features of the TRC-15A are of special interest. Channel selection is simplified by the use of push buttons on the Studio Unit. Optional external meters for display of any selected channel are simply connected to the appropriate barrier terminals. Four external meters may be used with the TRC-15A. Long-life, light-emitting diodes (LED) are used as visual indicating devices on the TRC-15A. Indicators are provided on the Transmitter Unit to show the selected channel. Auxiliary power supply voltages are available from the rear apron of the Transmitter Unit to power Moseley telemetry accessories.

## FULL FRONT PANEL



Front View, slide-out drawer partially extended, Studio Unit. Total access is afforded to active circuitry.

## CONTROL

Fail-safe provisions in the TRC-15A meet all existing FCC requirements and will function with the loss of primary power, interconnecting circuit failure, or an actual malfunction of the equipment itself. The actual fail-safe detector in the Transmitter Unit senses the presence of an audio control tone carrier. An interruption of approximately 15 seconds will trip the fail-safe circuitry. This 300 Hz carrier is generated in the Studio Unit as long as power is applied and maintains fail-safe integrity. For actual control functions, this carrier is frequency-shift keyed (FSK) to approximately 375 Hz. The duration of the shift to 375 Hz determines the function to be accomplished. Channel selection is accomplished with the front-panel push button. Two functions, designated RAISE and LOWER, can be performed on each channel selected. While performing a RAISE or LOWER control function, a parameter can be monitored simultaneously. As only one shift rate can be accomplished at any point in time, RAISE and LOWER functions cannot be activated while a channel relay is being selected.

## TELEMETRY

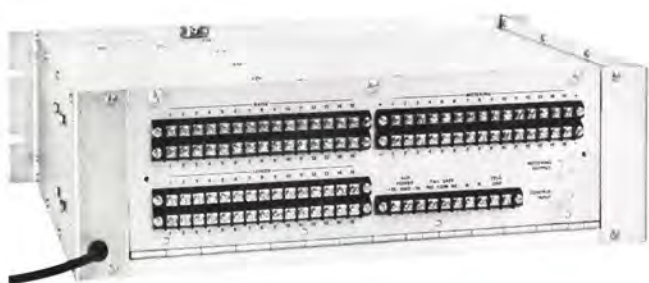
Telemetry is accomplished through the use of an additional tone. DC sample voltages representing parameters to be remotely observed are converted to an audio tone in the Transmitter Unit. This signal is then relayed to the Studio Unit and converted back to a DC voltage proportional to the input sample voltage for display on the 4-inch, taut-band, panel-mounted meter. Either of two audio spectrums may be used for conveying this information. These spectrums are 20 Hz to 30 Hz, or 800 Hz to 1200 Hz. Multiturn calibration controls for each channel are provided on the Transmitter Unit for ease of calibration.

# and Wireless Remote Control

## ACCESSIBILITY

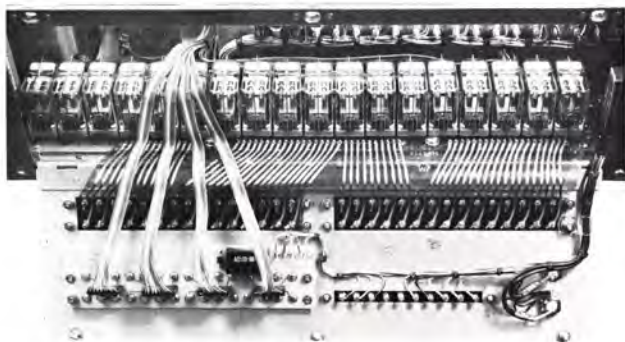


Front View, Transmitter Unit, showing full access. Note LED channel indicators in lower-left of front panel.



Rear View, Transmitter Unit. Individual terminals for all inputs and outputs are provided for ease of installation. Rear-panel hinges open for greater access.

## NO STEPPER RELAY



Rear panel hinged open, Transmitter Unit. With panel open, all relays are accessible. Relays are socketed for easy maintenance.

## ORDERING INFORMATION

### TRC-15AW

Only a half-duplex, voice-grade telephone circuit is necessary for operation of the TRC-15AW. DC continuity is not required. Telemetry is accomplished with an audio tone in the 800 Hz to 1200 Hz spectrum. With the control FSK signal, overall spectrum requirements are 300 Hz to 1200 Hz. The interconnecting circuit should not attenuate this spectrum by more than 30 dB.

### TRC-15AR

For wireless service, the TRC-15AR is designed to mate with Moseley aural STL equipment. Control information is transmitted to the Transmitter Unit on a subcarrier multiplexed on the STL. Included in the TRC-15AR are a control subcarrier generator and detector. A 26 kHz control subcarrier is used for monaural STL systems, and for the Model PCL-505/C Composite stereo STL system, a 110 kHz subcarrier is utilized. Telemetry information is subaudible, 20 Hz to 30 Hz. The return path for the telemetry information can be an SCA channel of an FM transmitter, AM carrier, or other radio circuit capable of handling 20 Hz to 30 Hz.

Audible telemetry information, as described for the TRC-15AW, is available on special order for voice-radio circuits.

Contact the Marketing Department of Moseley Associates for information on special versions to fulfill individual requirements.

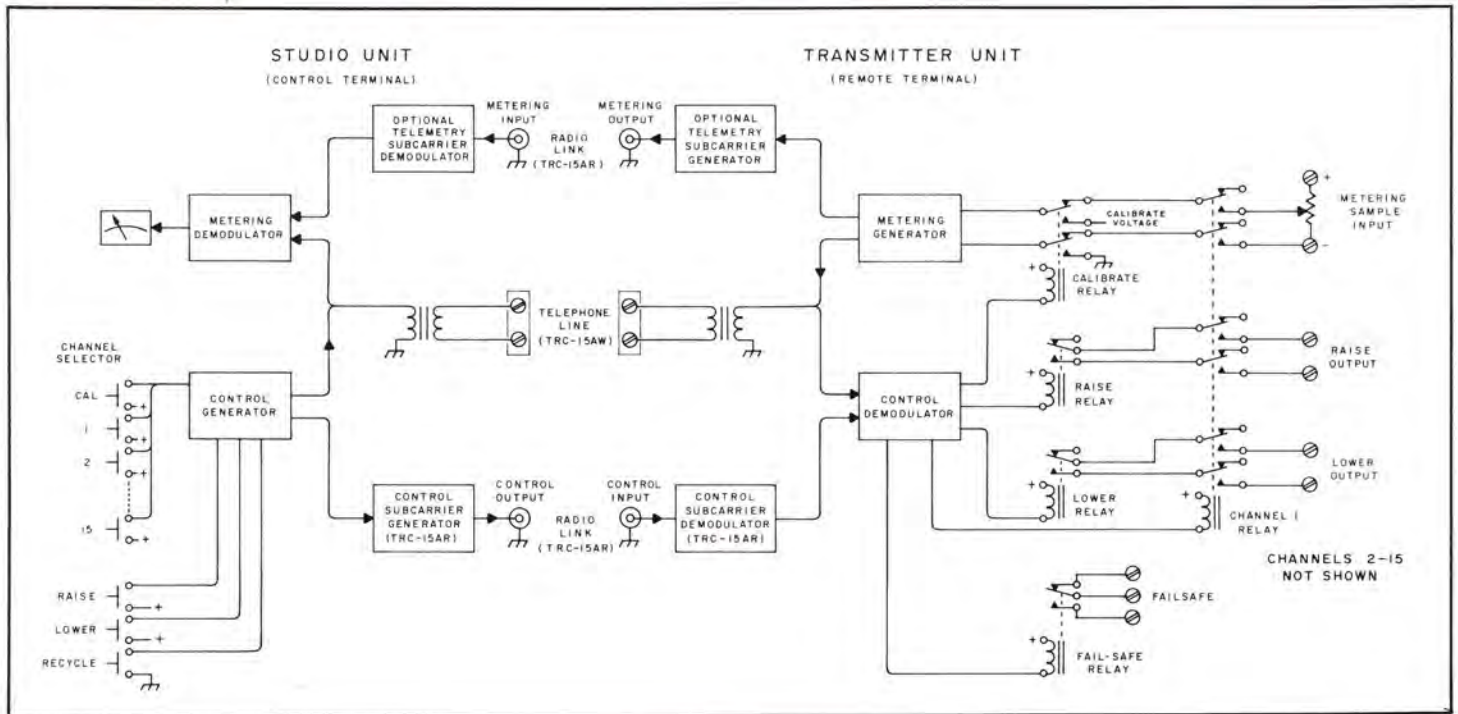
## OPTIONS

When an FM subcarrier is to be utilized for telemetry return, the Telemetry Subcarrier (SCA) Generator is available with the TRC-15A. This generator is mounted internally in the Transmitter Unit. Likewise a Telemetry Subcarrier (SCA) Demodulator for mounting in the Studio Unit is available. See the block diagram on the rear of this bulletin for placement of these options.

## ACCESSORIES

Telemetry accessories including a linear-readout temperature-sensing kit, AM and FM RF diode sampling kits, chopper-stabilized DC amplifier and more. Request Bulletin 264 for further information.

# Model TRC-15A Remote Control System



## SPECIFICATIONS

**Metering Functions** \_\_\_\_\_ 15 telemetry channels, plus calibration

**Control Functions** \_\_\_\_\_ 15 RAISE, 15 LOWER (30 total)

**Control Output** \_\_\_\_\_ Momentary contact closure or redistribution of externally-supplied control voltage up to 120V AC or DC. Maximum load 50 watts non-inductive.

**Meter** \_\_\_\_\_ 1, taut-band with carefully controlled ballistics, 100 microamperes F.S. Provisions for 4 external meters.

**Metering Stability** \_\_\_\_\_ With weekly transmitter-unit checks and daily studio-unit checks, better than 1% exclusive of operator setting or reading error.

**Metering Accuracy** \_\_\_\_\_ 2% or better of full scale.

**Telemetry Input Requirements** \_\_\_\_\_ + or -1V to 10 VDC for full-scale deflection. All inputs fully isolated from ground. Maximum 350V potential to ground. Input impedance 20,000 ohms.

### Telemetry Frequencies

**Audible** \_\_\_\_\_ 800 Hz to 1200 Hz

**Subaudible** \_\_\_\_\_ 20 Hz to 30 Hz

**Control Frequencies** \_\_\_\_\_ 300 Hz and 375 Hz, nominal

### Interconnection Requirements

**TRC-15AW** \_\_\_\_\_ Voice-grade, data-channel telephone circuit (Interstate FCC Tariff 260, type 3002 channel), 600 ohms, 30 dB allowable loss from 300 Hz to 1200 Hz. DC continuity not required.

### TRC-15AR

**Control Circuit** \_\_\_\_\_ Control subcarrier generator and detector provided internally. Studio Unit Output and Transmitter Unit Input: 0.5V rms, 2,000 ohms, nominal, unbalanced. Nominal subcarrier operating frequencies 26 kHz to 110 kHz.

**Telemetry Circuit** \_\_\_\_\_ Telemetry return path capable of handling 20 Hz to 30 Hz.

Transmitter Unit Output: Up to 6V P-P (adjustable) behind 600 ohms, unbalanced.

Studio Unit Input: 1.5V P-P, bridging, unbalanced.

### Optional Telemetry Subcarrier (SCA) Generator

\_\_\_\_\_ 26 kHz to 100 kHz, internally mounted, 0.5V rms, 2,000 ohms, unbalanced, nominal.

**Operating Temperature Range** \_\_\_\_\_ -20°F (-30°C) to 160°F (70°C)

**Power Requirements** \_\_\_\_\_ 120/240 VAC, ±10%, 50-60 Hz  
Studio Unit: 20 watts, nominal  
Transmitter Unit: 20 watts, nominal

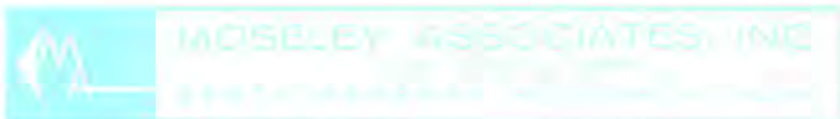
### Size

**Studio Unit** \_\_\_\_\_ 5¼" H x 19" W x 13⅝" D  
(133mm x 483mm x 345mm)

**Transmitter Unit** \_\_\_\_\_ 5¼" H x 19" W x 13⅝" D  
(133mm x 483mm x 345mm)

**Shipping Weight (approx.)** \_\_\_\_\_ 65 lbs. (29.5 kg), 5.7 cubic ft. (0.16 cu.m)

Specifications subject to change without notice.



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