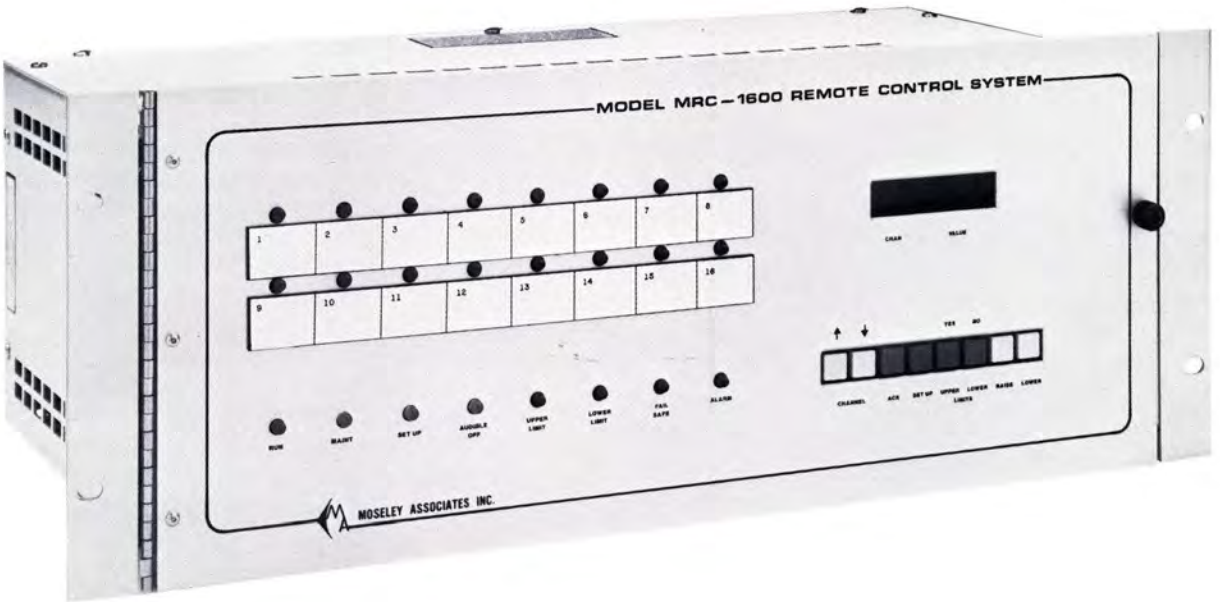
MICROPROCESSOR REMOTE CONTROL

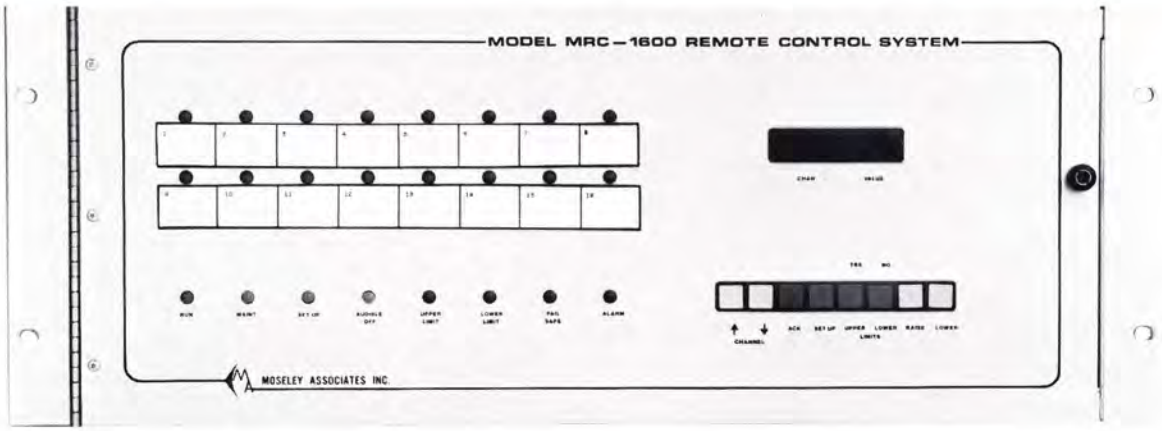
Bulletin 288



MRC-1600

MOSELEY ASSOCIATES, INC.
A FLOW GENERAL COMPANY

MRC-1600



The MRC-1600 Microprocessor Remote Control offers microprocessor flexibility and sophistication in an economical and dependable package for general AM-FM remote control applications. It comes equipped with 16 status inputs, 16 telemetry inputs, 16 raise command outputs and 16 lower command outputs. Each command output is relay-isolated. Adapting the MRC-1600 to current system interconnections is easy. Plug-in modules can be ordered to accommodate almost any interconnection system, from standard 2-wire or 4-wire telephone lines to FM subcarriers, subaudible telemetry, or a custom combination of any of these.

The MRC-1600 is also suitable for other applications where television telemetry failsafe is not required, like low power television (LPTV) facility control. Telemetry limit checking and status alarm capability help ensure that an unmanned facility operates at peak efficiency while any alarm conditions, such as fire or intrusion, are quickly relayed to an operating position so that appropriate action can be taken. The user is cautioned to be certain that any applicable FCC Rules regarding fail-safe operation are followed in the use of this system.

SETUP AND OPERATION

System setup and calibration are done at the Remote Terminal with eight color-coded buttons. For each channel, during setup, upper and lower telemetry limits may be set or disabled independently, and telemetry data may be calibrated in one of four modes: power, indirect power, linear, or millivolt. Status inputs may be set to display direct or inverted and may be programmed to trigger an alarm on rising, falling, or rising and falling waveforms. Once setup and calibration are complete, all data is copied to the Control Terminal, ensuring that recalibration and setup will not be necessary should either terminal be shut down temporarily.

MRC-1600

Moseley Memory is standard on the MRC-1600. In event of power down, all setup data, calibration information and limits are stored on electrically-alterable read-only memory (EAROM) for up to ten years. This ensures fast system restart after power is restored.

The MRC-1600 front panel is simple to operate and easy to understand. All status channels are displayed simultaneously on a set of 16 LEDs. Alphanumeric LEDs give readouts of selected channel number and telemetry data while eight color-keyed LEDs indicate system operation mode, alarms, etc.

MRC-1600 operation is straightforward. The system constantly checks telemetry data for each channel against assigned upper and lower limits. Any channel exceeding its limits immediately sets off audible and visible alarms. Pressing the ACKnowledge button displays the relevant channel number, telemetry information, and upper or lower limit LEDs so the operator can push either the raise or lower key to bring telemetry values for that channel back within limits.

The MRC-1600 operates two special system test channels. One checks A/D conversions and provides an alarm when tolerance exceeds factory set limits. The other gives the user readouts of conditions for both control to remote, and remote to control data links. In compliance with current FCC Regulations, the MRC-1600 has full control fail-safe provisions. Fifteen seconds after loss of control contact between terminals, aural and visual alarms are initiated.

After 45 seconds, the RUN LEDs will extinguish and the control fail-safe relay at the Remote Terminal will relax. MRC-1600 Remote Terminals are also equipped with a Maintenance Override mode which, when activated, ignores Control Terminal commands but continues to update status and telemetry data. LEDs and auxiliary contacts are provided to enable warnings to personnel that the Remote Terminal is in the override mode.

OPTIONS

The CRT option for the MRC-1600 gives the broadcaster full control of the transmitter from the keyboard at the Control Terminal. All status and telemetry data are displayed simultaneously on an ADDS Viewpoint A2 terminal. Status and telemetry field titles can be up to 14 characters long and may be changed at any time. Seven characters each are allotted for telemetry units, status on and status off displays. The CRT also indicates time of day, data-link status and Maintenance Override at the Remote terminal.

An Automatic Logging option can be added to the CRT option to provide a printed log of station operation. A Texas Instruments Model 850 printer records status and telemetry data at user-specified intervals from one minute to twenty-four hours.

SPECIFICATIONS

Type of System:
- *Microprocessor-based Control Terminal and Remote Terminal*

Types of Memory Used:
- *Programmable Read-Only Memory for system firmware*
- *Random Access Memory for user-programmed functions*

Moseley Memory:
- *Retains data for ten years minimum, on electrically-alterable read-only memory (EAROM).*
- *Holds calibration factors, status and command assignments.*
- *With CRT, or CRT and Logger options, stores CRT text and logger setups.*

System Configuration:
- *One Control Terminal, one Remote Terminal per system*

Command Lines:
- *Two (one raise, one lower) per channel, momentary, total of 16 "raise", 16 "lower"*
- *Command response time: 400 ms to implementation, nominal*
- *Form C relay (SPDT) output standard, up to 2A, 30 VDC or 120 VAC (non-inductive) per relay*

Telemetry Channels:
- *16 channels, unbalanced input*
- *One-person digital calibration, via Remote Terminal keyboard*
- *Fully tolerance alarmed, one high and one low limit*
- *Linear, power-to-linear conversion, indirect power, millivolt calibration*
- *Full four-digit LED display with decimal point and polarity sign*
- *Resolution: one part in 4096*
- *Overall measurement accuracy: better than 0.5%*
- *Response time: 500 ms, nominal, with audible data*
- *Full-scale input level: 0.25V minimum, 1V minimum recommended, 4.5 VDC maximum*

Status Channels:
- *16 channels, each displayed by individual LEDs on Control Terminal and Remote Terminal front panels*
- *User-programmable N.O./N.C., momentary or latching, alarm on rising and/or falling waveform*
- *Status response time: 400 ms, nominal, with audible data*
- *TTL-compatible input standard (+5 VDC switched by external contacts)*

Aural Alarms:
- *Control and Remote Terminals, defeatable and remoteable*

Fail-Safe:
- *Control: Complies with current FCC requirements for AM and FM radio station operation*

Maintenance Override:
- *Remote Terminal front-panel button*
- *Provides Remote Terminal "go home" relay closure, Control Terminal and Remote Terminal LED indication*

Number of Data Interconnection Links:
- *One*

Data Transmissions:
- *Eight-bit ASCII plus parity*
- *300 baud each direction standard (audible)*
- *9.4 baud telemetry with subaudible telemetry option*
- *Two-way, simultaneous via FSK*

Wire Interconnection:
- *Two-wire or four-wire, 600 Ω, balanced*
- *Series 3002 unconditioned data channel per Bell System Technical Reference Publication 41004 (FCC tariff No. 260) for 300 baud (standard)*
- *Two-way simultaneous*
- *Nominal send level: 0 dBm; Minimum receive level: -30 dBm*

Radio Interconnection:
- *Single or duplex, internal subcarrier systems*
- *Available on standard frequencies between 26 and 185 kHz*
- *Nominal send level: 1.5V p-p at 2.2 kΩ*
- *Nominal receive level: 0.25V p-p at 2.2 kΩ*
- *Specify frequency and exact radio link when ordering*

Remote Terminal Connectors:
- *Terminal strip connectors for status, telemetry inputs, command outputs*

Operating Temperature Range:
- *0° - 50°C*

Power Requirements:
- *120/240 VAC, 50/60 Hz, 30W typical (per terminal)*

Physical Size:
- *Control Terminal: 17.8 cm H x 48.3 cm W x 21.6 cm D (7"H x 19"W x 8.5"D), depth less connectors*
- *Remote Terminal: 17.8 cm H x 48.3 cm W x 22.9 cm D (7"H x 19"W x 9"D), depth less connectors*

OPTIONS

CRT Terminal:
- *ADDS Viewpoint A2 CRT terminal with full keyboard and 12-inch CRT.*
- *15-foot cable and software.*
- *1200 baud (120 characters/second).*
- *Installs at Control Terminal.*

Automatic Logging:
- *Texas Instruments Model 850 printer.*
- *15-foot cable, attaches to AUX port on CRT terminal at Control Terminal.*
- *1200 baud (120 characters/second).*
- *User-programmable channel list header text, and log intervals (stored in non-volatile memory).*
- *Available only if CRT is also present.*

Subcarrier and Subaudible:
- *26, 39, 41, 67, 92, 94, 110, 152, 185 kHz available.*
- *May be purchased in combination with Telco if desired.*

FOR FURTHER INFORMATION
PLEASE CONTACT OUR MARKETING DEPARTMENT

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