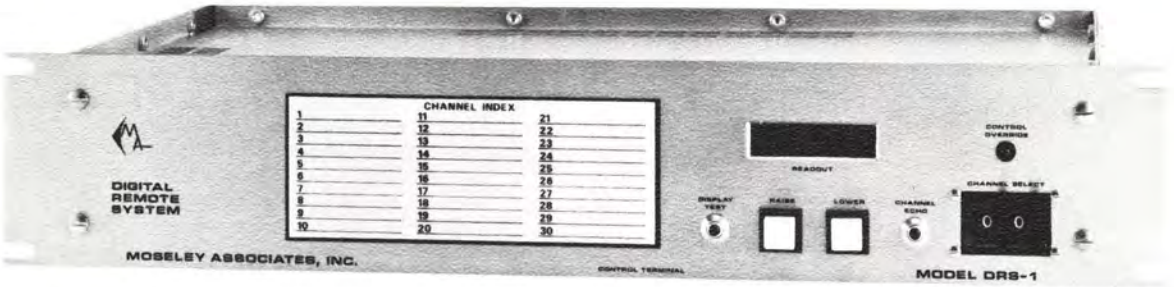
DIGITAL REMOTE SYSTEM MODEL DRS-1A

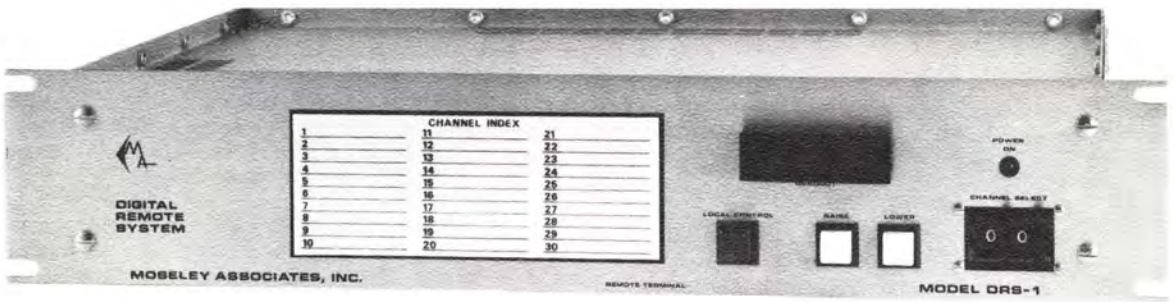
Bulletin 249A

ALL DIGITAL SYSTEM-

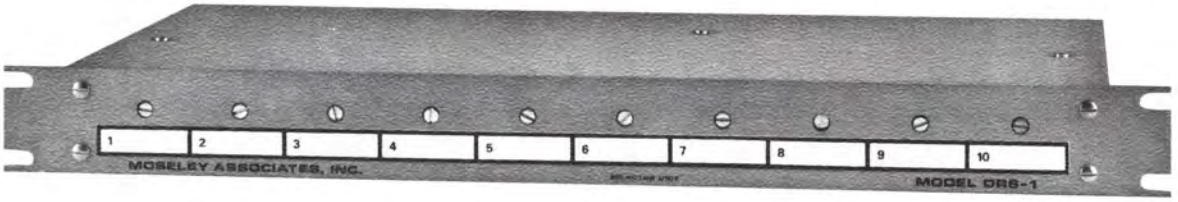
☐ COMMAND ☐ TELEMETRY ☐ STATUS



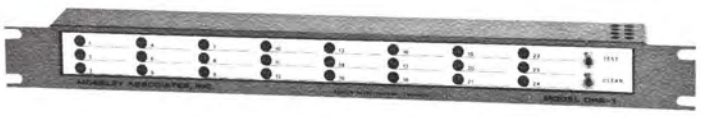
Control Terminal



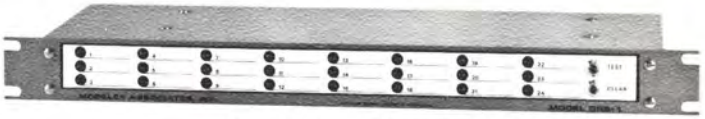
Remote Terminal



10-Channel Selector Unit



Optional — Status Panel-Control Terminal



Optional — Status Panel-Remote Terminal

FOR BROADCAST AND INDUSTRIAL SERVICE

MOSELEY ASSOCIATES, INC.

MODEL DRS-1A

- ☐ Completely Integrated System Concept
- ☐ Field Expandable
- ☐ Remote Control — to 30 Channels
- ☐ Status/Alarm — 24 Channels
- ☐ Companion Automatic Parameter Logging
- ☐ Internal Data Modems Provided
- ☐ Wire or Wireless Operation

Totally digital command, telemetry, status/alarm and automatic parameter logging are supplied, at an affordable price, by the Moseley Associates **Model DRS-1A Digital Remote System** and its associated units. The basic DRS-1A System provides command and telemetry capability. The **Status Subsystem** of the DRS-1A enables display and transmission of status/alarm functions. Automatic recording of telemetered parameters is available with the companion **Model DLS-1 Digital Logging System.**

The basic DRS-1A Digital Remote System is divided into three units — Control Terminal, Remote Terminal and Selector Unit(s). The Control Terminal is located at the remote control point, normally the studio location in broadcast transmitter remote control. The Remote Terminal and Selector Units are situated at the transmitter site, or location of equipment being controlled. Positioning can be seen in the block diagram on the rear of this bulletin. Each Selector Unit provides 10 telemetry/command channels, which allows for field expansion or tailoring of the DRS-1A to fulfill specific channel requirements. A maximum of 30 channels (3 Selector Units) may be used.

Each telemetry/command channel provides a single telemetry function and two command functions. These command or control functions are individual Form A, isolated dry contact closures and are typically identified as Raise and Lower. The Raise and Lower command outputs can switch external loads of up to 50 watts, non-inductive at potentials of 120V AC or DC. Telemetry inputs accept a DC sample voltage representing the desired analog parameter. This DC voltage is typically in the 1 VDC to 10 VDC range.

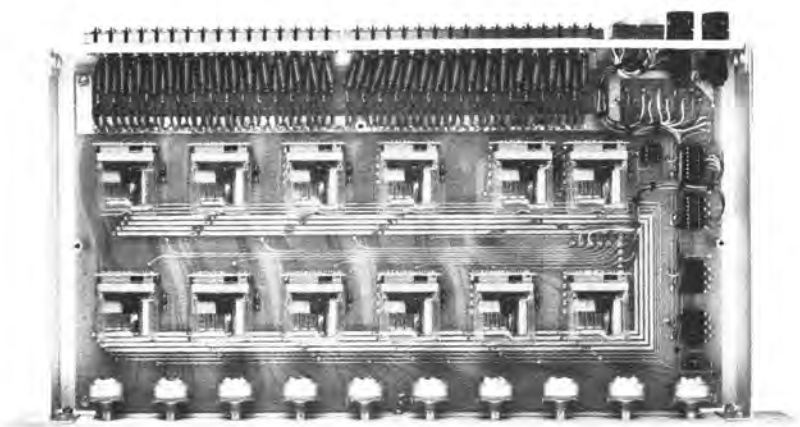
Every telemetry channel is displayed digitally as a 3 or 3½ digit numeric presentation. With an input of 2 VDC, a maximum numeric display of "1999" is possible. A display of "999" can be obtained with an input of 1 VDC. **Individual calibration potentiometers,** provided on each telemetry channel, enable calibration of the numeric display to be identical to the value of the selected parameter. Digital numeric light-emitting diode (LED) displays are located on both Control and Remote Terminals. **One-man system calibration** is afforded by the digital numeric display on the Remote Terminal. For calibration, it is only necessary to adjust the calibration potentiometer until the digital numeric display shows a value equal to the selected parameter.

Operation of the DRS-1A Digital Remote System is greatly simplified allowing even unskilled operators to efficiently control and observe a remotely located transmitter plant. The front panel of the Control Terminal contains channel select and command controls as well as telemetry display. Telemetry/command channels are selected with centrally-located lever-wheel assemblies. These assemblies provide direct-reading channel numbers. After channel selection, the parameter being telemetered is automatically displayed. Raise and Lower buttons enable activation of command functions. When the command function is accomplished, the Raise or Lower button is illuminated as a **true-tally** signifying activation of the Raise or Lower relay. This tally-back gives operator confidence previously not available in a system in this price range. For even greater confidence, the channel echo capability allows tally-back and display of the selected channel.

All controls and the telemetry display are duplicated on the Remote Terminal. Local control at the transmitter site is seized by the Remote/Local switch. When depressed, command information, including channel selection, can only be accomplished from the Remote Terminal. When in the local mode, an indication is sent to the Control Terminal illuminating the "Control Override" LED to inform the operator that he has lost command capability. Further, an additional set of controls on the Remote/Local switch is terminated on the rear apron of the Remote Terminal and can be used for an external indication of switch position. These contacts are commonly referred to as "go home" indicators, and can prevent maintenance personnel from leaving the Remote Terminal in the Local mode.

Interconnection between the Control Terminal and Remote Terminal can be by either **wire or wireless** means. For wire or telephone line operation, the system is identified as the DRS-1AW. Radio link, or wireless operation, is provided by the DRS-1AR. FM subcarrier modules can be mounted in both Remote and Control Terminals. Refer to the Ordering Information section and the block diagram on the rear of this bulletin for further information on subcarrier modules.

Digital techniques are used in the DRS-1A for all functions. DC sample voltages are converted in the Remote Terminal



Interior View — DRS-1A Selector Unit. Individual relays provide for channel selection. Each relay is socketed for easy replacement. Telemetry calibration potentiometers for each channel are shown at the bottom. All external inputs and outputs pass through L/C filters, shown at the top.

to serial digital information by an analog-to-digital (A-D) converter. Both telemetry and command information is organized into 8-bit serial digital words. Modems (modulators/demodulators) in the Remote and Control Terminals enable transmission of the digital words. These modems convert the digital words to frequency-shifted keyed (FSK) audio tones which can be transmitted over telephone or radio circuits. Error checking is included to assure absolute accuracy of telemetry and command information. These techniques, when combined with the various true-tally functions, virtually guarantee error-free operation with proper interconnection circuits.

Fail-safe circuitry in the DRS-1A complies with current Federal Communications Commission requirements for broadcast transmitters. For the control fail-safe requirements of standard, FM and TV service, the presence of correct command information is continuously sensed in the Remote Terminal. Should command information not be received for a period of 20 seconds, the control fail-safe relay in the Remote Terminal is de-activated. For telemetry fail-safe with television transmitters, the DRS-1A functions with the Model FSU-1 Fail-Safe Unit. See Bulletin 237 for further information on the FSU-1. The Control Terminal provides a unique indication of telemetry return failure. With an interconnection interruption, or other telemetry failure, the digital numeric display flashes on and off at a one-Hertz rate. Further, an output is provided on the rear apron of the Control Terminal for an external alarm indication.

The **Status Subsystem** of the DRS-1A provides for 24 status/alarm (go/no-go) indications. Typically, applications include the sensing of illegal entry, fire and smoke alarms, over/under temperature, transmitter status, tower lights, or any similar go/no-go condition or function. The subsystem consists of the Status Panel-Control Terminal and the Status Panel-Remote Terminal. Both panels operate from the power supplies and modems in the DRS-1A Control and Remote Terminals. Each status channel is encoded from external normally-open dry contacts. Closing of these contacts illuminates a light-emitting diode (LED) on both status panels. The subsystem is of the latching type. When a channel is activated, the LED remains illuminated until manually reset at either Remote or Control Terminal.

An additional feature is provided by the Status Panel-Control Terminal. A transistor sink to ground is provided for each channel which is activated when a channel is encoded. These sinks will switch an external load of 200 ma, 24 VDC, enabling the use of external alarms, relays, warning lamps, or similar devices.

Subcarrier equipment for totally wireless operation is available as modules with the DRS-1A.

Interior View — DRS-1A Remote Terminal. Computer wire-wrap-type construction is used in both Control and Remote Terminals. Subcarrier and modem modules are mounted on unique fold-out assemblies for easy servicing. All active electronics, except for power supply components, are mounted in a totally shielded enclosure. All connections are routed through feed-through filters for isolation from nearby high-energy RF fields.

ORDERING INFORMATION

DRS-1AW

Only a single voice-grade telephone circuit is required for operation of the DRS-1AW. Frequency-shift keyed (FSK) audio tones are utilized for command and telemetry information. Maximum attenuation of the interconnecting circuit is 30 dB. Ten-channel capacity is standard. Order one additional Selector Unit for 20 channels or two additional Selector Units for 30 channels.

DRS-1AR

For wireless service, the DRS-1AR is designed to function with Moseley Aural STL equipment. Control information is transmitted to the Remote Terminal via an FM subcarrier multiplexed on the STL. A control FM subcarrier generator and demodulator are standard in the DRS-1AR. For monaural STL's, a 26 kHz subcarrier frequency is utilized. For the composite STL system, the subcarrier frequency becomes 110 kHz. Audible telemetry (1300-1500 Hz) is standard. Ten-channel capacity is standard. Order one additional Selector Unit for 20 channels or two additional Selector Units for 30 channels. Contact Moseley Associates' Marketing Department for information on special versions to fulfill individual requirements.

Status Subsystem

The Status Subsystem provides 24 status/alarm, or go/no-go type indications. It functions as an integral part of the DRS-1AW or DRS-1AR.

Options

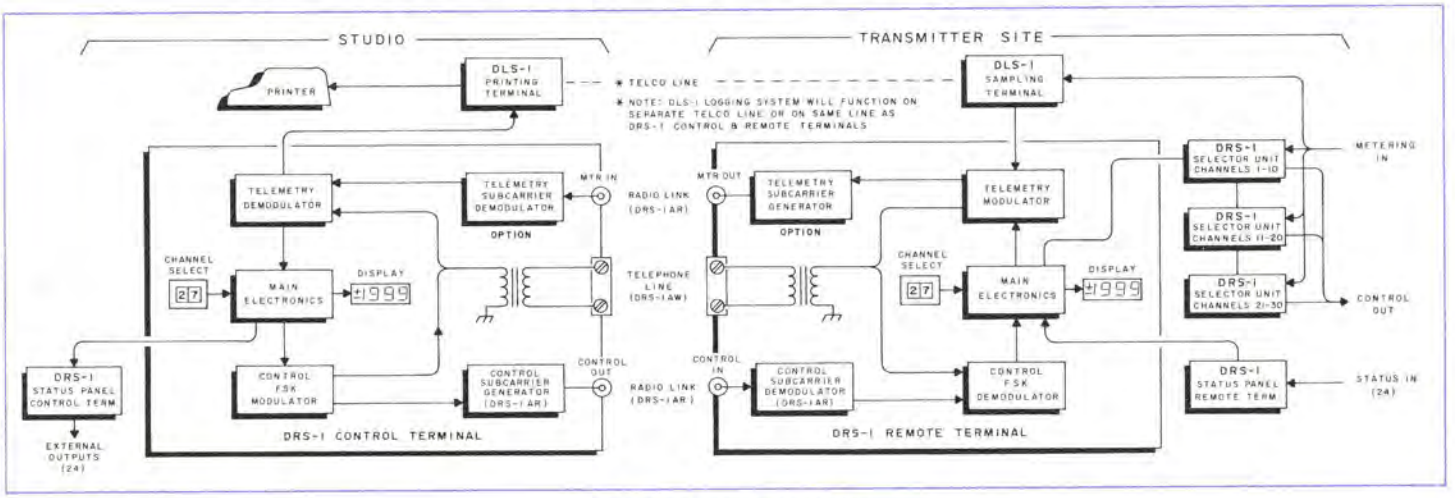
The Model DLS-1 Digital Logging System provides for automatic recording of operating parameters. Up to 20 parameters may be recorded with this system. For further details, refer to Product Bulletin 251.

When an FM subcarrier is to be utilized for telemetry return, the DRS-1A has the capability of accepting a subcarrier generator module and subcarrier demodulator module. See the block diagram on the rear of this bulletin for placement of these modules. These modules are identified as Telemetry Subcarrier (SCA) Generator for DRS-1A and Telemetry Subcarrier Demodulator for DRS-1A.

Accessories

Telemetry accessories, including linear-readout temperature sensing kit, AM and FM RF diode sampling kits, power-to-linear converter, and control interface items are available. Request Bulletin 248 for further information.

MODEL DRS-1A DIGITAL REMOTE SYSTEM



SPECIFICATIONS

Type — Digital command and telemetry

Channel Capability — 10 minimum, expandable to 20 or 30 total. Each channel provides one telemetry function and two command or control functions.

Control Output — Relay contact closure, isolated and floating. Contacts rated for maximum load of 50 watts, non-inductive, 120V AC or DC.

Telemetry Input — 1 VDC (nominal) differential for full scale (±999) display. Full 100% overrange capability with 2 VDC (nominal) differential required for display of ±1999. Each input fully floating. Input impedance 100KΩ.

Telemetry Display — Digital LED display, 3½-digit, with polarity.

Telemetry Accuracy — 0.1% of full scale

Telemetry Response Time — 270 milliseconds.

Fail-Safe — Control — Relay contact closure (SPDT), closed in energized (operational) position. De-energized (opened) 20 seconds after control failure to Remote Terminal.

Fail-Safe — Telemetry — Provisions for use with independent Model FSU-1 Fail-Safe Unit, complying with current FCC broadcast requirements for television telemetry fail-safe operation.

Interconnection Requirements

DRS-1AW — 2-wire, voice-grade telephone circuit, 600Ω balanced, (Reference Series 3002 Data Circuit), 300-3000 Hz, maximum permissive attenuation 30 dB, send level 0 dBm, composite. All functions accomplished via FSK signals. Command 2300-2500 Hz; Telemetry 1300-1500 Hz; Optional DLS-1 Digital Logging System 750-900 Hz.

DRS-1AR — Control FM subcarrier generator and demodulator included as standard. Subcarrier send/receive level 1.5 volts peak-to-peak; input/output impedance, 2000Ω, nominal, unbalanced. Subcarrier frequency 26 kHz for monaural STL, 110 kHz for composite STL; other frequencies 26 kHz to 185 kHz on special order. Audible telemetry (1300-1500 Hz) provided. Telemetry send level, 1.5V peak-to-peak, 2000Ω nominal, unbalanced. Telemetry receive level, 0.1V to 2V peak-to-peak, 2000Ω, nominal, unbalanced. Optional telemetry subcarrier generator and detector modules available on special order. Operating levels and impedance same as control subcarrier equipment. Typical frequency — TV 39 kHz; FM 67 kHz.

Operating Temperature Range — −20°C to +70°C

Power Requirements — (30-channel configuration, including Status Subsystem with all channels activated)

Control Terminal — 120/240 VAC, 50-60 Hz, 30W

Remote Terminal — 120/240 VAC, 50-60 Hz, 35W

Size

Control Terminal — 3½ inches high, 19 inches wide, 12 inches deep (8.9 cm x 48.4 cm x 30.5 cm)

Remote Terminal — 3½ inches high, 19 inches wide, 10 inches deep (8.9 cm x 48.4 cm x 25.4 cm)

Selector Unit — 1¾ inches high, 19 inches wide, 9½ inches deep (4.4 cm x 48.4 cm x 24.1 cm)

STATUS SUBSYSTEM

Type — Digital, latching, functions with DRS-1A System

Channel Capability — 24

Input — External normally-open dry contacts. Closure activates channel.

Status Display — Light-emitting diode (LED) for each channel on both Control and Remote Terminals. Display is latched following activation until cleared at either Remote or Control Terminals.

Output — Independent transistor sink to ground for each channel on Control Terminal. Each sink capable of switching maximum load of 200 ma, 24V.

Interconnection Requirements — Functions with modems in DRS-1A Remote and Control Terminals.

Operating Temperature Range — −20°C to +70°C

Power Requirements — Derived from companion DRS-1A System

Size

Status-Control Terminal — 1¾ inches high, 19 inches wide, 2½ inches deep (4.4 cm x 48.4 cm x 6.4 cm)

Status-Remote Terminal — 1¾ inches high, 19 inches wide, 6 inches deep (4.4 cm x 48.4 cm x 15.2 cm)

Specifications subject to change without notice

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