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INSTRUCTION MANUAL

Type TRC-3

Transmitter Remote Control System

Continental Electronics

MANUFACTURING COMPANY

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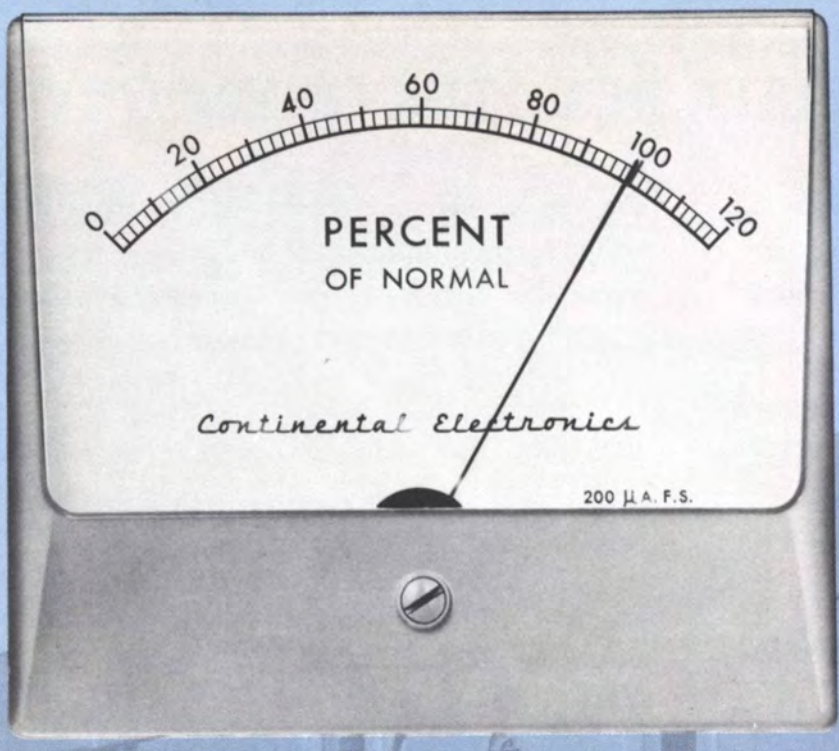

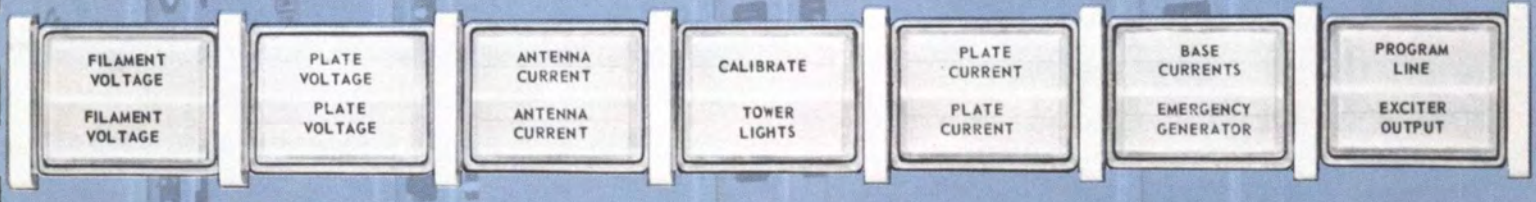

TYPE TRC-3

TRANSMITTER REMOTE CONTROL

■ Human engineered for simplified, reliable control by the busy studio operator ■ Color-illuminated push buttons individually designated for each function ■ Simplified monitoring and logging by a single meter in "Percent of Normal" ■ Direct all relay control — no dials, stepping relays, tone channels, or marginal relays ■ Uses economical signaling grade circuits — extended operation over telephone lines up to 8000 ohms ■ All studio controls and indications are duplicated at the transmitter terminal ■ Fail-safe circuitry throughout — meets all FCC requirements for unattended operation ■ Modulation and frequency monitoring via proven off-the-air receiver ■ Fault Alarm system automatically indicates fire, building entry, and other transmitter plant conditions ■ The combined remote control and alarm systems provide inexpensive method for automatic logging ■ Specified by major networks and the majority of unattended 50 KW stations in the United States.

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TYPE TRC-3 TRANSMITTER REMOTE CONTROL

Human engineered for the busy studio operator, Continental's newly designed Type TRC-3 offers the utmost in simplicity and reliability in unattended operation.

All meter readings are presented on a single meter which is calibrated in "Percent of Normal." Observation and logging of any function is direct and simple, with all normal readings requiring only a standard log entry.

Dials, charts, and scale interpretations are replaced by individually designated pushbuttons, thereby minimizing human error. All pushbuttons are illuminated red, green, or yellow to logically indicate the active functions, and also to provide report-back signals for certain transmitter functions.

Red lamps indicate presence of transmitter plate voltage, and are extinguished automatically on plate overload.

Operational dependability is further assured by use of all relay DC control circuits which eliminate stepping relays, tone channels, and marginal relays. Faults resulting from line noise, lightning discharge, etc., are eliminated.

The basic system consists of a TRC-S Studio Terminal, TRC-T Transmitter Terminal, and a number of accessory items, the exact number of which are determined by specific station requirements.

The terminal units are constructed on vertical chassis with hinge-down front panels for maximum component accessibility. They are designed for mounting in standard 19" equipment racks and require vertical panel spaces of 8¾" for the Studio, and 12¼" for the Transmitter Unit.

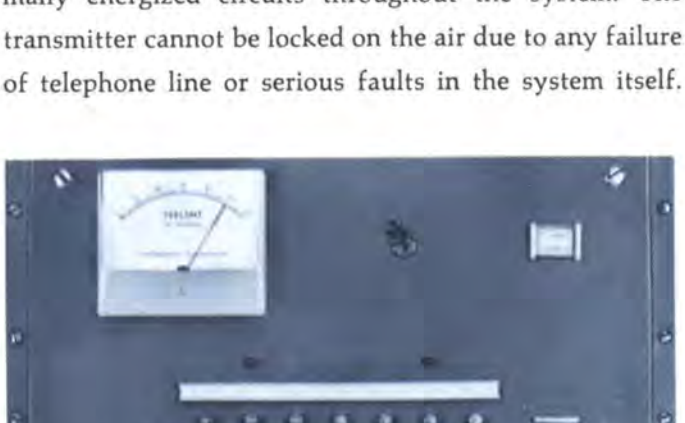
All studio control of metering and switching functions is duplicated at the transmitter terminal. A duplicate meter and indicating lamps are also provided.

System components are of MIL-Spec. or telephone quality throughout. They are conservatively rated for years of trouble-free service. All relays are of the plug-in type, and most are hermetically sealed.

The Type TRC-3 system requires two interconnecting telephone lines which may be inexpensive, signaling grade, commercial service. Both must be continuous metallic balanced pairs, and each may have up to 8000 ohms loop resistance. One pair is used for control from the studio to the transmitter with high-level DC voltages impressed from either side of the line to ground. The other pair returns low-level metering signals via a balanced connection to the studio.

Fail-safe operation is assured through the use of normally energized circuits throughout the system. The transmitter cannot be locked on the air due to any failure of telephone line or serious faults in the system itself.

TYPE TRC-S STUDIO TERMINAL



TYPE TRC-T TRANSMITTER TERMINAL

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TYPE MR1C MONITOR RECEIVER

Continental's Monitor Receiver is a high-quality, fixed-tuned TRF unit used for monitoring transmitter operation at the studio location. Off-the-air signals are picked up by a shielded loop antenna, amplified by the receiver, and fed to the station's modulation and frequency monitors which are located at the studio.

The receiver incorporates a front panel meter which may be used to indicate relative field intensity at the pickup point. In addition, the unit provides an audio monitoring channel which provides a 600 ohm output that is essentially flat to 10 KC. A carrier warning lamp and buzzer arrangement provides an indication of the presence of carrier, and an alarm on loss of carrier.

TYPE TRC-FA3 FAULT ALARM SYSTEM

Continental's Fault Alarm System is a monitoring device for use at unattended transmitting stations. It automatically provides remote alarm and indication in the event of a change of status in any one of 10 or 15 monitored conditions.

Any function such as fire, building entry, heating system failure, etc., which can be reduced to a normally-closed circuit in its normal condition, may be presented as a fault indication at the studio.

The studio presentation consists of a series of indicator lamp assemblies, one corresponding to each fault. Under normal conditions, all lamps are lighted green. Should a fault occur, all lamps are extinguished and an alarm sounds. The system will then automatically interrogate the fault inputs and present the information as red or green lamp indications at the studio. When the fault is corrected, the alarm will sound again and all lamps will automatically return to a green indication.

The system consists of two 8¾" rack-mounted units; a Transmitter Terminal, and a Studio Terminal located at the control point. These units are designed as accessories to Continental's Type TRC-3 Remote Control System, and as such they operate over the two telephone lines provided for the TRC System. Special telephone lines are not required for the Fault Alarm System, nor are any of the TRC System functions required for its operation. The Fault Alarm System may be used as a separate facility over its own telephone lines if desired.

Through the use of contact-making meters installed at the transmitter location, circuits can be established for above and below normal values of critical transmitter parameters. When assigned to inputs on the Fault Alarm System, this arrangement becomes a type of automatic logging if used with inexpensive recorders installed at the transmitter location.

TYPE TRC-FA3-S STUDIO TERMINAL

TYPE TRC-FA3-T TRANSMITTER TERMINAL

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TYPE TRC-3 TRANSMITTER REMOTE CONTROL SYSTEM ACCESSORIES

TYPE 31121-B, Mechanical Latching Relay Unit. Connects between TRC-T unit and transmitter for control of circuits locally controlled by switches, such as filaments on-off, emergency generator on-off, etc. 4PDT contacts rated 10A., 115 VAC, non-inductive.

TYPE 31122-B, Electrical Latching Relay Unit. Similar to Type 31121-B, except unit is held in ON position through its own contacts, will automatically release if transmitter site power fails momentarily. DPDT contacts rated 10 A., 115 VAC, non-inductive.

TYPE 31123-B, Momentary Output Relay Unit. Connects between TRC-T unit and transmitter for control of circuits locally controlled by pushbuttons, such as pattern change, and existing motors. Two sets DPDT contacts rated 15 A., 115 VAC, non-inductive.

TYPE 5522-A, Tower Lights Metering Unit. Produces DC sample proportional to current, includes current transformer.

TYPE 31124-B, Motor and Clutch Assembly. Reversible motor operating directly from TRC-T unit. Rated at 2.8 RPM, 95 in-oz. Other speed and torque ratings available on special order.

TYPE 31125-B, Report-Back Relay Unit. Provides lamp signal at studio terminal to indicate that the particular switching function has been operated ON or OFF. Two units can be used per system.

TYPE 31126-B, Program Line Reversing Unit. Changes transmitter inputs between main and spare program lines. Built-in battery provides studio metering indication according to position of lines.

TYPE 31128-B, Line Voltage Metering Unit. Used with 115 VAC or 230 VAC circuits to produce a DC sample proportional to voltage. Provides filament voltage metering if connected across primary of filament transformer.

TYPE B31099-1, Antenna Current Metering Unit. Produces rectified DC sample proportional to R.F. current. AC power not required. For currents of 0 to 15 amperes R. F. Type B31099-2 used for currents of 15 amperes and above.

STANDARD RELAY TYPES USED IN TRC-3 SYSTEM ACCESSORIES

DOSX-7T Relay, may be connected at TRC-T switching output to control external "pushbutton" circuit, or may be used as auxiliary relay in transmitter or other external circuitry requiring interlocking. 115 VAC coil, DPDT 15 A., 115 VAC non-inductive contacts.

DOSX-12T Relay, same as DOSX-7T, except with 230 VAC coil. For use in transmitter and other external circuitry requiring interlocking.

DOSX-59T Relay, same as DOSX-7T, except with 110 VDC coil. For transmitter overload reset and TRC-T "auxiliary" outputs.

RBM 101130-101 Contactor*, heavy-duty industrial type. May be connected at TRC-T switching output to control external "pushbutton" circuit, or for interlocking use in external circuitry. Recommended for Plate on-off control. 115 VAC coil, 3PNO reversible contacts, rated 10 A., 115 VAC non-inductive.

RBM 101150-101 Contactor*, same as 101130-101, except has 5PNO reversible contacts.

*Contactors also available with 230 VAC coils, and with 15 A. reversible and 25 A. N.O. contacts.

SPECIAL PURPOSE ACCESSORY UNITS. From time to time, custom accessory units are designed to meet particular specifications or unusual station requirements.

Continental Electronics Co
MANUFACTURING COMPANY
Mailing Address: Box 17040, Dallas 17, Texas, 4212 S. Buckner Blvd., EV 1-7161 LTV Subsidiary of Ling-Temco-Vought, Inc.

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INTRODUCTION

The Continental Electronics Type TRC-3 equipment is a simplified and reliable Transmitter Remote Control System, fulfilling all FCC requirements for unattended transmitter operation. The equipment provides facilities for the remote control and monitoring of one or more transmitters of any power level, and is specifically designed with operator convenience in mind.

The system consists of two main units; a Transmitter Control Terminal, located at the transmitter site, and a Studio Control Terminal, installed at the broadcast studio or control point. The units are designated Types TRC-T and TRC-S, respectively. The two terminals are interconnected by standard telephone lines, and provide simultaneous control and metering of the transmitter plant operation. A companion monitor receiver is usually furnished for air-check monitoring of Percent Modulation, Frequency Deviation, Carrier Failure and Audio Quality.

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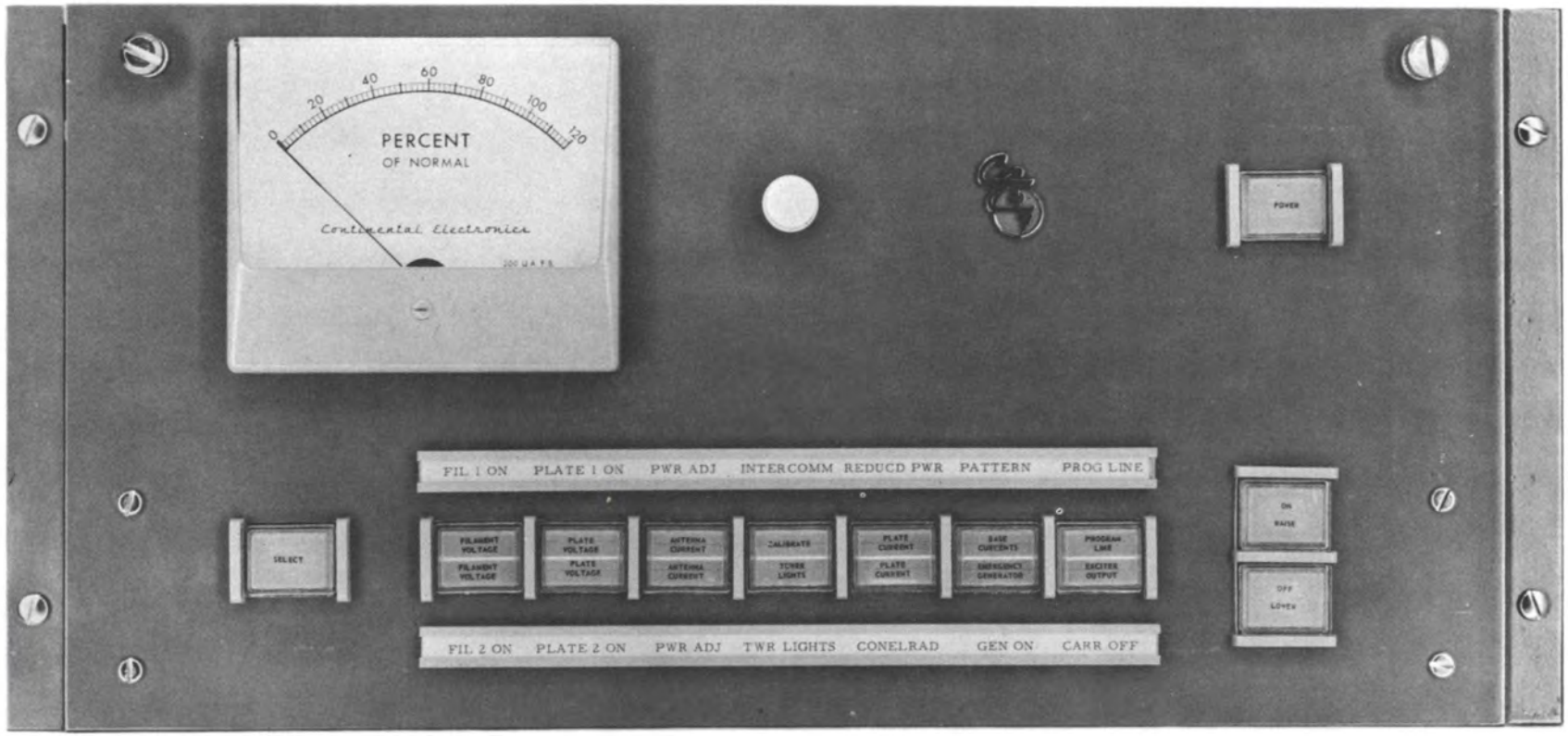

A. TYPE TRC-S STUDIO UNIT, FRONT PANEL

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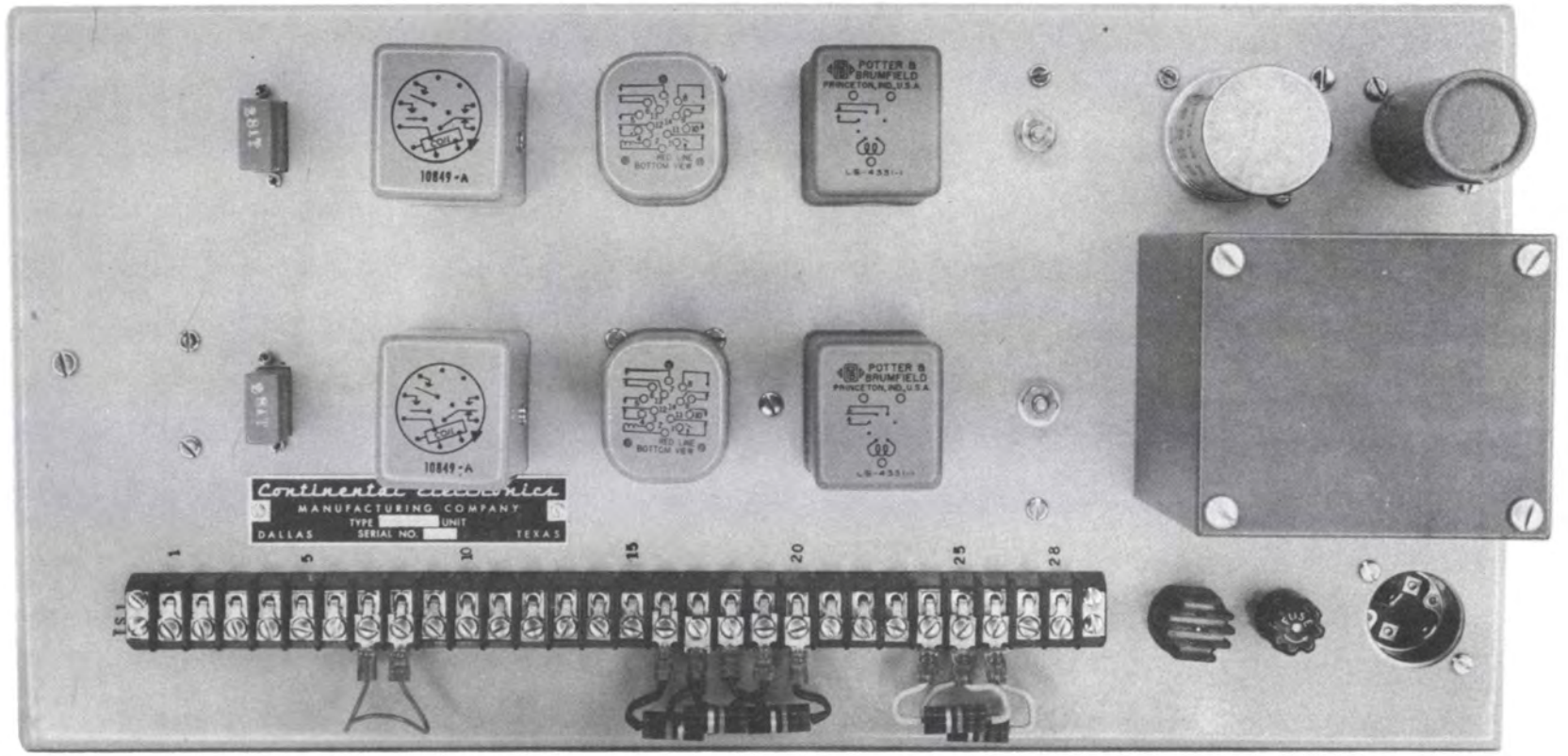

B. TYPE TRC-S STUDIO UNIT, REAR VIEW

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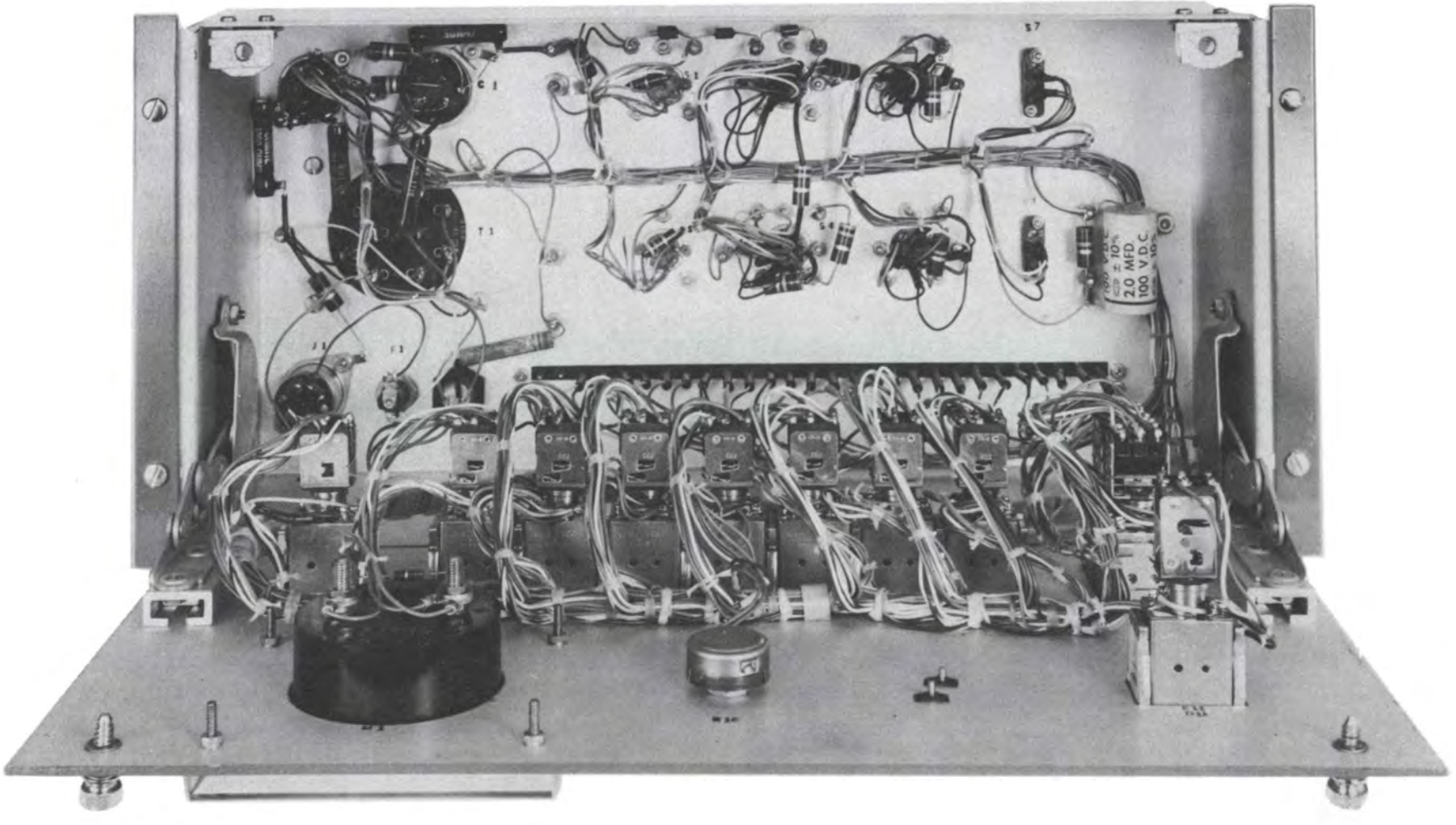

C. TYPE TRC-S STUDIO UNIT, INSIDE CHASSIS

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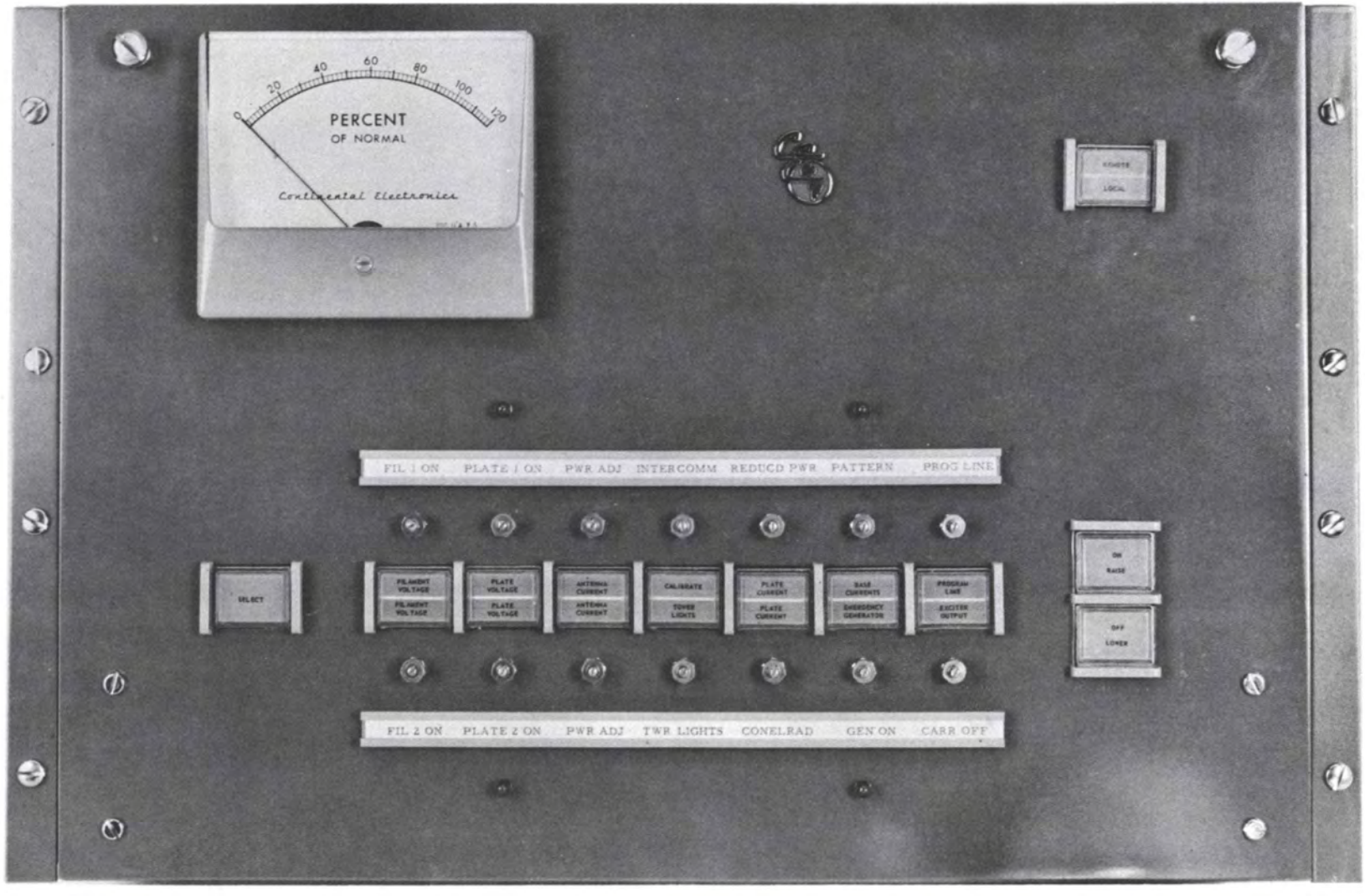

D. TYPE TRC-T TRANSMITTER UNIT, FRONT PANEL

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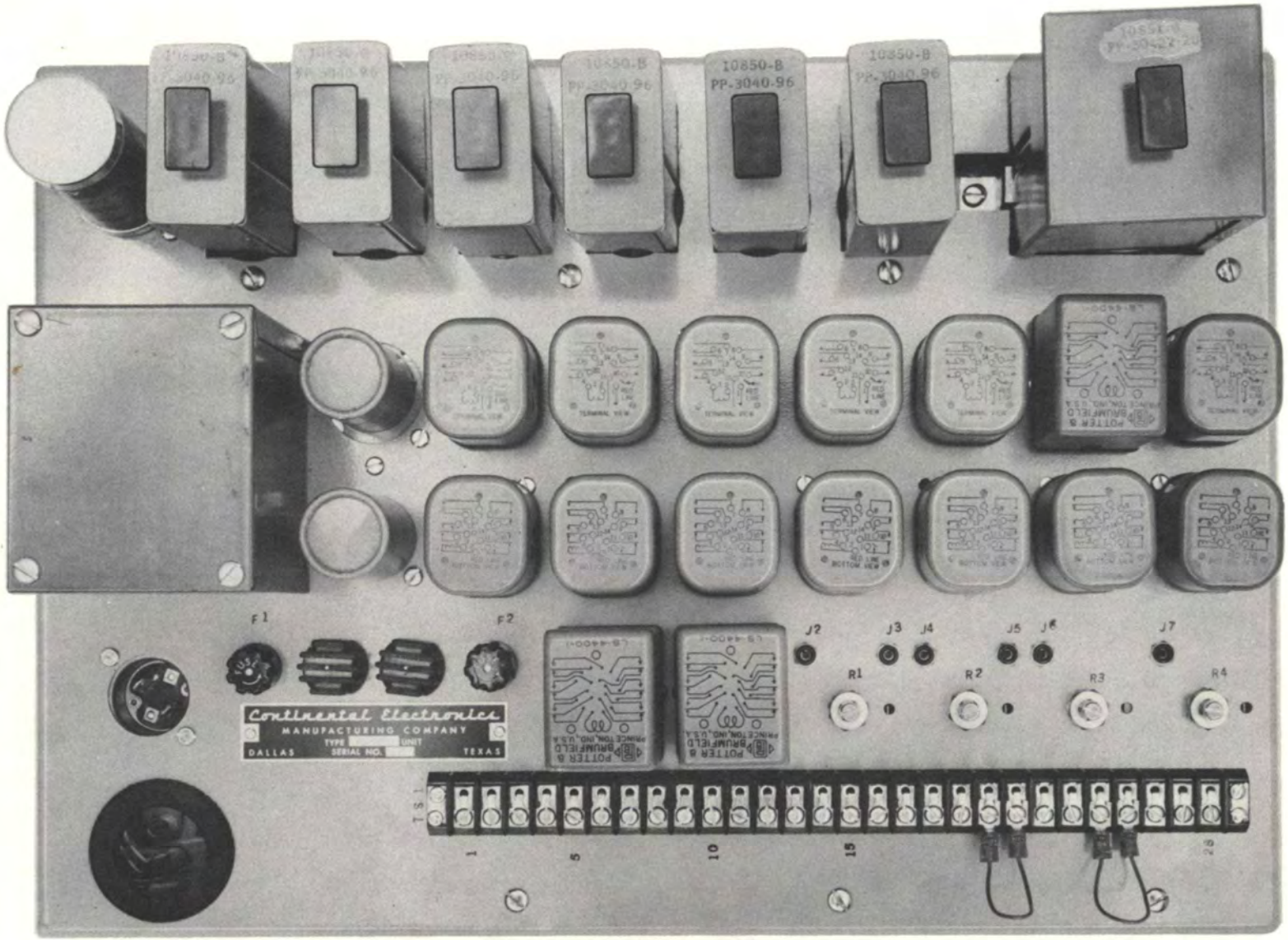

E. TYPE TRC-T TRANSMITTER UNIT, REAR VIEW

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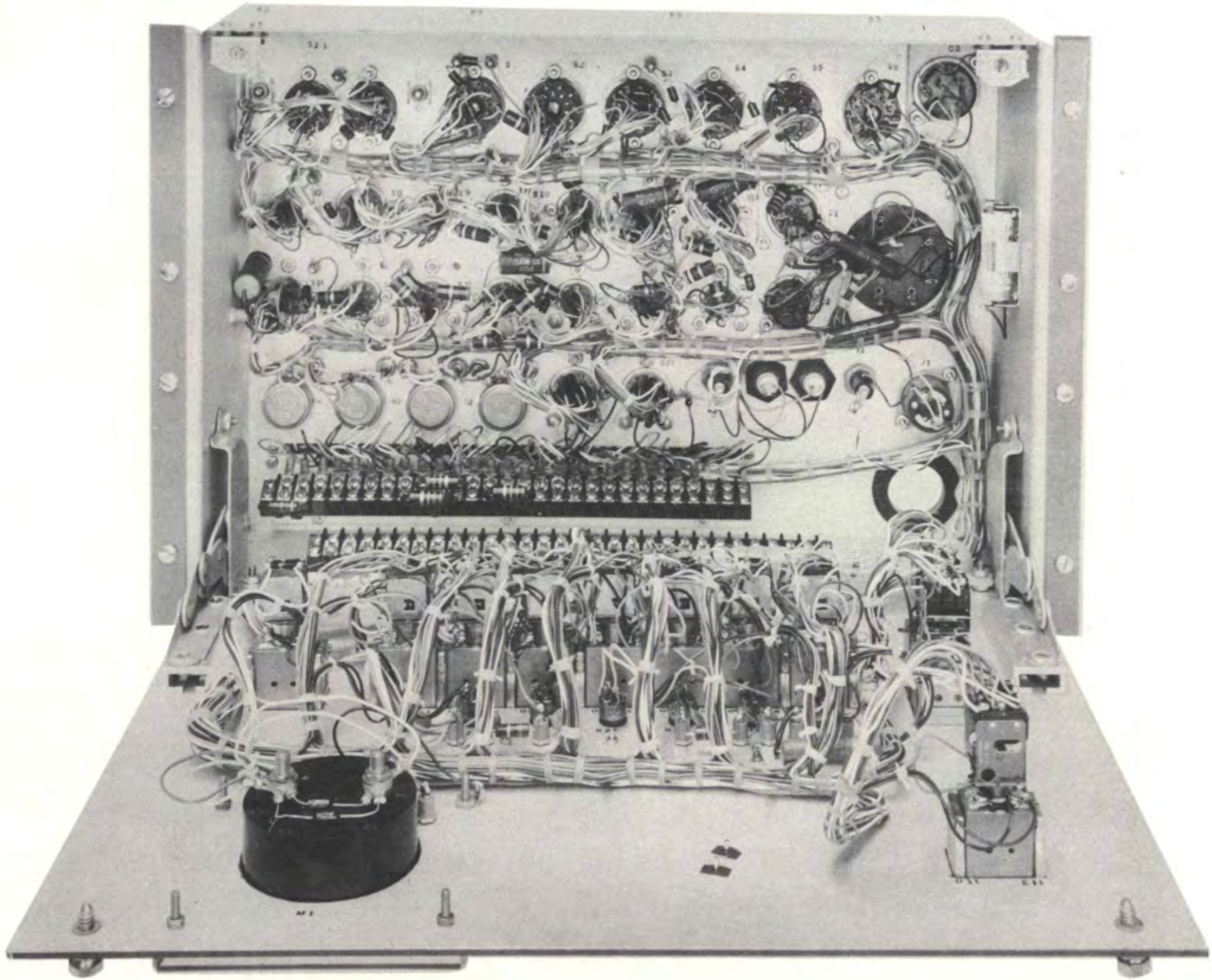

F. TYPE TRC-T TRANSMITTER UNIT, INSIDE CHASSIS

GENERAL DESCRIPTION

The Type TRC-3 Transmitter Remote Control System is an all DC operated equipment, designed for the operation of one or more transmitters. The system contains no dials, stepping relays, marginal relays, or tone channels. Primary and standby transmitters may be controlled from the same unit, or if desired, the system may be used for the simultaneous control of separate transmitter facilities. (An AM/FM operation, for example.)

The control units are arranged for simplified pushbutton operation, with each illuminated pushbutton designated with the particular function it performs. All studio terminal controls are duplicated at the transmitter terminal, and telemetered indications are presented on a single studio meter, which is calibrated in "Percent of Normal". After initial calibration of each metered quantity at "100%", observation and logging of any function is simple and direct. During normal operation, all quantities are logged at 100%, and a simple checkmark will suffice for the log entry. There are no chart listings or conflicting scale readings to interpret.

Fail-safe operation is assured, in that the transmitters are automatically taken off the air if the control telephone line fails, or if a serious fault occurs in the control units themselves. The use of normally-energized control circuits throughout precludes any condition whereby the transmitter might be locked on the air. The TRC-3 system requires two inter-connecting telephone pairs, of "Signaling Grade" classification (the least expensive commercial service), between the studio and transmitter. Both must be metallic, balanced circuits suitable for DC operation. One telephone pair is used for control, from studio to transmitter, with DC voltages impressed from either side of the line to ground. The other pair returns low-level metering signals to the studio location. Telephone line loop resistances of up to 8000 ohms are permissible.

Two major units, the Type TRC-S Studio Terminal, and the Type TRC-T Transmitter Terminal, are arranged for mounting in standard 19-inch equipment racks. The Studio Terminal requires 8-3/4" of vertical rack space, while the Transmitter Unit is 12-1/4" high. The units are constructed on vertical chassis, with hinge-down front panels for maximum component accessibility. All relays plug in, and most are hermetically-sealed units.

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The system provides for separate pushbutton control of fourteen metering and fourteen switching functions. Included in these is a metering calibration function, using a standard mercury cell as a voltage reference.

The fourteen functions are divided into two groups, "A" and "B", for convenient control from seven basic pushbuttons. A separate pushbutton, designated SELECT, is used to sequentially pre-set the system to the "A" or "B" group of functions. The seven basic pushbuttons are split horizontally, and the SELECT function illuminates the upper or lower halves of these buttons, corresponding to the particular group selected.

The basic pushbuttons are referred to as Number 1 through 7 (left to right, fron the unit front), and are equipped with transparent caps to retain specific titles for the particular metering functions chosen. Each pushbutton may be fitted with two titles, one for the upper half and one for the lower half of the designation cap. Thus, through the SELECT function, we have metering positions 1A through 7B, or fourteen basic metering positions in all.

Associated with each of the metering positions is a switching function, which is controllable from the pushbuttons designated ON/RAISE and OFF/LOWER. These pushbuttons are momentary, but the switching action at the transmitter terminal may be momentary or sustained, depending upon the device to be controlled (See Section 10.) Before performing a particular function, the function must first be selected by depressing one of pushbuttons 1 through 7. While holding this pushbutton, the switching function is operated ON or OFF by depressing the ON/RAISE or OFF/LOWER button. The function pushbutton is then released. Convenient designation strips are mounted immediately above and below the seven basic pushbuttons, and typed designations may be inserted to label each switching function to be controlled by a particular pushbutton. The illustrations in Section 2 show typical metering and switching assignments.

The supplemental controls, POWER, SELECT, LOCAL-REMOTE, ON/RAISE, and OFF/LOWER, which are not used in actual function selection, are illuminated yellow. The pushbuttons controlling the fourteen basic functions are illuminated green, with the exception of No. 4A, which is white. No. 4A is always assigned to CALIBRATE, and as such is color-keyed to the white meter adjust control, used to normalize the metering circuit at the pre-set calibration point.

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The pushbutton for functions 2A and 2B is illuminated green in its left portion, being lighted to correspond with Select Group A or B. The right portion, however, contains red lamps, which are lighted as report-back signals from switching functions 2A and 2B. Since 2A and 2B are normally assigned to plate voltage control, the red supervisory lamps show the transmitter condition at all times. The lamps remain lighted until the function is switched off, but will be automatically extinguished should transmitter overload, and consequent shutdown, occur. The lamp indications are operated by return signals from the distant transmitter unit, and are not subject to false or out-or-sequence operation, as direct indications from the studio control switches might be.

Similar red lamps are provided for functions 6A & 6B and again, operate from transmitter unit report-back signals. In this case, however, the lamps are lighted and extinguished only as the result of studio unit switching of the controlled function. They may not be used, therefore, for plate voltage indication, or for supervision of any other switching operation that might arbitrarily change status.

An additional supervisory indication of transmitter status is the metering circuit itself. To provide failsafe action, the system normally dwells on function 3, corresponding to a positive control line voltage condition. Antenna Current is normally assigned to this position, and continuous monitoring of transmitter output power thus obtains.

The TRC-3 system is fully compatible with the Type TRC-FA3 Fault Alarm equipment, which is a monitoring system available as an accessory. The Fault Alarm equipment provides remote alarm and indication in the event of a change of status in any of a group of monitored conditions, such as fire, building entry, etc. All operating voltages and terminal connections necessary to interconnect the two systems are built into the TRC-3 equipment.

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CIRCUIT DESCRIPTION

A. Basic Polarity Control. The TRC-S and TRC-T units each contain power supplies, to convert 115 volts, 60 cps, into two half-wave DC voltages. The voltages are positive and negative, with respect to ground, and isolation transformers separate the DC circuitry from the AC power lines.

The polarity of the voltages applied to the control telephone line, at TS1S-3 and -4, is determined by pushbuttons D1S through D8S. The polarity of the control line determines which combination of TRC-T unit relays is energized. With all pushbuttons in their normal positions, the line voltages are positive and equal.

For convenience, polarity control relays S1T through S4T are designated A through D, respectively. The "Function Chart" below shows which of these relays are energized for the various line polarity conditions.

Function Chart

No.	Control Line 2 Tip	Ring	Control Relays
0	0	0	None
1	+	0	A
2	-	0	B
3	+	+	A+C
4	+	-	A+D
5	-	+	B+C
6	0	-	D
7	0	+	C
8	-	-	B+D

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The four control relays are connected to the telephone line through polarizing diodes, and their contacts are arranged to form a modified transfer "tree" network. This network is shown in simplified form on Drawing No. 31118-A, and it is seen that the "tree" input voltages are connected so that eight separate outputs are produced. These output voltages operate the coils of "auxiliary" relays S7T through S13T, corresponding to the seven basic polarity functions. The eighth output operates Select relay S21T.

B. Switching Control. Referring to TRC-S Schematic 31100-E, it is seen that the power supply is arranged to provide two positive and two negative output voltages. The lower voltage in each case, is zener diode regulated at 75 volts. The higher voltage is unregulated, and is normally 130 volts under load.

When operated, control pushbuttons D1S through D8S connect the telephone line to the proper power supply at the 75 volt level. These voltages are supplied along the "ON/RAISE + and - BUS" and the "OFF/LOWER + and - BUS". Upon operation of the ON/RAISE (D9S) or OFF/LOWER (D10S) pushbutton, the respective "BUS" leads are transferred from the 75 to the 130 volt power supply outputs.

Thus, the basic function pushbuttons establish the correct telephone line polarity at the 75 volt level. Subsequent operation of the ON/RAISE button increases that voltage to the 130 volt level on the tip side of the line, while operation of the OFF/LOWER button increases the voltage on the ring side of the line to 130 volts.

At the TRC-T unit, control relays S1T through S4T operate from the studio 75 volt level, and the increase to 130 volts has no effect on their operation. (Controls R3T and R4T are adjusted to produce 40 volts at J6T and J7T, respectively, at the TRC-T unit.) S5T (ON/RAISE) and S6T (OFF/LOWER) are also connected to the telephone line, at the tip and ring sides, respectively. These relays, however, are voltage-biased with series connected zener diodes, which have been selected along with the relay pull-in voltage to limit the voltage available to the relay coils, with the result that S5T and S6T do not operate on the lower voltage level. At the 130 volt studio level, sufficient voltage is available to pull up S5T and S6T, and the particular relay will remain energized until the studio voltage drops back to 75 volts. The contacts of S5T and S6T are wired to produce switching

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output voltages at TS3T, corresponding to the fourteen switching functions, 1A through 7B.

The relays chosen for these control positions are close-differential units. That is, their drop-out voltage is very close to their pull-in voltage. It is this characteristic, coupled with the biasing effect of the zener diodes, which produces a control system of high operational reliability.

Referring the the Function Chart, it is seen that polarity control establishes the particular metering function to be transmitted, while voltage-level control operates a switching function associated with that metering position. ON or OFF control is effected by changing the voltage level on the tip or ring side of the telephone line. Note, however, that there are several polarity conditions wherein one side of the line is at zero potential. Since we are unable to change the voltage under these conditions, special voltages are transmitted to the transmitter terminal via the metering telephone line, for these cases. Paragraph C reviews the use of the metering line for these and other functions.

C. Combined Use of Metering Line. The primary purpose of the metering line is to transmit quantitative information to the control point. Meters are installed on both terminal units, and are, effectively, connected in series.

Through the use of polarizing diodes, the metering line may also be used to transmit control voltages between the units. Drawing No. 31119-B is a simplified schematic of the metering line, and the various uses of the circuit are tabulated below.

(1) Telemetering. Metering current is transmitted through the metering line as a series loop. Circuit is effectively balanced at the studio terminal.

(2) Switching Control. In Paragraph B, above, it was mentioned that the ON/RAISE and OFF/LOWER functions must be controlled via the metering line, for polarity conditions wherein one side of the control line is at zero potential. For functions 6 and 7, a positive ON/RAISE voltage is transmitted on the tip side of the metering line to relay S5T. Diode X9T

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blocks this voltage from the TRC-T unit metering circuit, and when S5T is connected to the metering circuit, the series connected zener diodes produce a high impedance to the normal metering voltage at that point.

For functions 1 and 2, a negative OFF/LOWER voltage is transmitted on the ring side of the line to S6T. X7T blocks this voltage from the low impedance to ground at R11T. Diode X8T, in series with S6T, blocks the metering current at this point, and also prevents S6T from responding to the positive "Interrogate" voltage.

(3) Fault Alarm Interrogate. When used as an accessory, the Type TRC-FA3 Fault Alarm System uses the metering line for data transmission, and to start its sequence of operation, a positive "Interrogate" voltage is placed on the ring side of the line. In this case, load resistor R11T is replaced by the alarm system Interrogate relay, which represents a low impedance to the normal metering signal.

(4) Select Report. To assure positive control of the studio Select (green) lamps, the lamp relays are energized by signals from the TRC-T unit. A negative "Select A Report" voltage is transmitted to S3S on the tip side of the line, and a positive "Select B Report" signal controls S4S over the ring side. X6S and X8S block the flow of metering current, and X7S prevents spurious line voltages from affecting S4S. S5S prevents the Select B Report voltage from returning via the tip side of the line.

D. Select Function. Polarity function No. 8, "Select", momentarily establishes a voltage on the input lead of Select relay S21T. This relay operates in impulse-latching fashion, sequentially reversing its contact position upon each input voltage pulse. The input voltage may derive from the control relay "tree", or from the TRC-T unit Select pushbutton, D8T, when in "Local" control. The relay's primary purpose is to transfer the remote control system between the "A" and "B" groups of metering inputs and switching outputs.

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Referring to Schematic 31101-R, S21T carries a number of transfer (Form C) contacts, one of which is used to directly control the metering common circuit. Relays S22T and S23T are controlled by another contact, and they in turn select the proper group of switching outputs. Other contacts control the transmitter terminal lamp circuits, and separate contacts are used for control of the No. 2 switching function.

S21T is a two coil relay, and carries additional interlocking contacts to produce an alternate open and close action from a single input lead. The lockup coil is slow-operate, and carries the load contact springs which lock up during the first current pulse. The contacts release when the quick-acting release coil is energized by another pulse over the same input lead.

E. Select Report. As discussed in Paragraph C, the metering line is used to signal the studio unit relays as the Select function is operated. Relays S3S and S4S operate directly from these signals and in turn control the studio lamp indications corresponding to the function group selected. Since the report signals are transmitted whenever the studio or the transmitter SELECT pushbutton is operated, lamp synchronism is assured at all times.

The report signals are momentary, and relays S3S and S4S are, therefore, electrically held through their own contacts, after the initial signals are received. These contacts are connected to make the two relays mutually exclusive; operation of one will release the other. To assure that proper lamp synchonism obtains, in case the transmitter SELECT pushbutton is operated with studio power removed, both relays are de-energized and all green function lamps are extinguished upon initial application of studio unit power. The SELECT pushbutton is immediately illuminated, however, and when operated, the Select function will report correctly, thus establishing correct lamp synchronism.

F. Auxiliary Relay Operation. The various outputs of the TRC-T "tree" network are connected to the coils of seven "auxiliary" relays, as shown on Drawing 31118-A. These relays, S7T through S13T, connect the actual circuits to be controlled and metered, to the proper TRC-T unit common circuits.

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Each relay has two normally-open (Form A) contacts which operate to connect the two metering inputs for that function, to the "A" and "B" group metering buses. These are then connected to S21T, where the actual metering circuit input is connected to bus "A" or "B". Two additional Form A contacts on each relay, connect the appropriate switching output terminals (via S22T or S23T contacts) to the ON/RAISE bus and OFF/LOWER bus. Voltages on these two leads are controlled by the ON/RAISE and OFF/LOWER switches and relays.

No. 2 Auxiliary relay, S8T, has special circuit connections for control of No. 2 switching outputs, and these are described in Paragraph J, below.

Indication units E1T through E7T each contain four lamps, designated A through D counter-clockwise from the upper right-hand lamp, as seen from the front. Lamps B and C are lighted by the auxiliary relay contacts in response to the particular pushbutton being operated at the studio, or transmitter, unit. B or C will light, depending on the Select group previously chosen. Lamp A and D are lighted only when the TRC-T unit is operated in "Local" control, and A or D will light, again depending on the position of the Select relay.

A special connection is made at the coils of the auxiliary relays, to bring the coil voltages to terminals TS2T-17 through -24. These "Auxiliary Output" voltages may be used to control external relays or lamps, corresponding to the particular function selected. Note that the output voltages may be positive or negative, depending on the particular coil voltage.

G. Transmitter Terminal Controls. The basic front panel controls were discussed in the General Description section. The TRC-T unit controls are essentially the same as those on the TRC-S unit, and although some additional circuitry exists, the control action is the same for the two terminal units.

In the studio terminal, operation of the POWER switch connects the unit to the power line and establishes a positive - positive control line voltage. In the transmitter terminal, the power is connected at all times, and the studio POWER switch position is occupied by a LOCAL /REMOTE switch, D11T. In normal operation this switch remains in the REMOTE position, but may be operated to LOCAL to establish control at the transmitter terminal. The following circuits are controlled by the LOCAL/REMOTE switch:

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(1) One section of D11T controls the AC voltage to the ON/RAISE-OFF/LOWER circuitry. In REMOTE, the voltage is connected to the contacts of S5T and S6T, thus permitting switching control from the studio, but disabling the transmitter terminal control switches. In LOCAL, the reverse is true, and in addition, the AC voltage appears at the TS2T-25, for control of external relays. Note that in LOCAL position, the transmitter operator effectively "locks-out" the studio control unit, thereby preventing conflicting control of critical switching functions. The studio control of metering functions is unaffected, however, and routine logging procedures may proceed as normal.

(2) The second section of D11T has a multiple use. In REMOTE, the switch completes a circuit from TS2T-3 to -4, which may be used as an input to the Type TRC-FA3 Fault Alarm System. When operated, the negative voltage from the alarm system will be interrupted, and a studio alarm will indicate that the TRC-T unit has been placed on local control. In this way the studio operator is made aware of control status, and can prevent maintenance personnel from leaving the studio "locked-out", inadvertently. In LOCAL, the positive voltage is connected through diodes X27T and X24T, to the Failsafe B+ circuit. (See paragraph J).

(3) The third section of D11T is a circuit similar to that described in (1). Positive voltage from the No.2 auxiliary relay is switched from the remotely controlled switching relays (S5T and S6T) to the local switching pushbuttons (D9T and D10T) for control of the No. 2A and 2B switching functions.

(4) The fourth section of D11T is for lamp voltage control. In REMOTE, the REMOTE indicator is lighted, and voltage is available to light the A and C lamps of the ON/RAISE and OFF/LOWER pushbuttons, as switching signals come in from the studio terminal. In LOCAL, the LOCAL, SELECT, ON/RAISE and OFF/LOWER (B & D) indicators are illuminated and the A or B group sections of the function pushbuttons are lighted.

As mentioned above, the TRC-T unit switching control pushbuttons are disabled until the unit is placed on LOCAL control. When lighted, they and the SELECT pushbuttons have the same

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action as the similar switches on the TRC-S unit. The seven function pushbuttons are active for metering selection at all times, however, and although it would be usual practice to first take LOCAL control in order to illuminate the button titles, the metering functions may be controlled while in REMOTE position. (Should the transmitter operator find the system on group A when a metering function of Group B was desired, it would first be necessary however, to take LOCAL control and operate the SELECT pushbutton.)

The wiring of function pushbuttons D1T through D7T is such that operation of these switches takes precedence over any studio operation. The switches, when operated, connect voltage of the proper polarity to the auxiliary relay in question. They also break the normally-closed series circuits that feed positive and negative voltage to the "tree" network inputs. These voltages, called "Signal B+" and "Signal B-" at the tree inputs, are then removed, thus preventing output from the tree, regardless of which function should be selected at the studio.

H. Metering Inputs. The system is capable of selecting fourteen metering inputs, of which one is permanently assigned to CALIBRATE, at function 4A. The remaining thirteen inputs appear at TS1T-7 through -19, and are each equipped with a 10,000 ohm input potentiometer. When the metering circuit is switched to a particular potentiometer, an effective metering input resistance of about 5,000 ohms results. Once the system is calibrated, the individual inputs may be normalized at 100% by adjusting their respective potentiometers.

These controls are mounted above and below the TRC-T unit function pushbuttons. The control above pushbutton 4A is connected across the TRC-T unit meter, and is used during initial system calibration to produce equal readings on the two meters, thus compensating for minor differences in meter internal resistance. Studio CALIBRATE control R16S is then adjusted for a 100% indication on both meters, while operating the pushbutton for No. 4A.

I. Switching Outputs. With the exception of functions 2A and 2B, all switching outputs appear as momentarily produced AC voltages at TS3T-3 through -28. These voltages derive from a separate 115 VAC source which is connected at TS3T-1 and -2. This voltage appears first at D11T-1, and in REMOTE

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position, is connected to the contacts of S5T and S6T. These contacts are connected in an interlocking fashion, preventing simultaneous outputs from the ON and OFF circuits. When the unit is in LOCAL control, the AC voltage is routed to switches D9T and D10T, where a similar interlocking circuit again prevents simultaneous outputs.

The switched outputs from the control relays and switches then appear on the ON/RAISE bus and the OFF/LOWER bus. A previous paragraph has discussed the connections from these points to the output terminals, via the auxiliary relay and S22T, S23T contacts.

J. 2A and 2B Switching Outputs. As mentioned, all switching outputs deliver momentary ON and OFF voltages except for functions 2A and 2B, which are usually assigned to plate voltage control. In these cases, the 115 VAC outputs at TS3T-7 and -8 are sustained, until the functions are switched off. This action is necessary since the transmitters must be switched off automatically in the event of telephone line failure or some other loss of remote control.

For these functions, the actual controlled relays are DC-operated relays S14T and S17T. Positive voltage is available for their actuation and release only when No. 2 auxiliary relay S8T is energized. The voltage then connects to relays S5T and S6T, or switches D9T and D10T, where momentary ON/OFF control is effected in a manner similar to that for AC switching control. The ON voltage then appears at SELECT relay S21T where it is separated into the 2A and 2B ON functions. The OFF voltage appears simultaneously on the 2A and 2B OFF relay coils (S15T and S18T), but the ground return of these coils is switched at S21T.

The momentary 2A ON voltage operates S14T, which latches in through its own contacts. This momentary voltage also appears at TS1T-22, where it may be used for transmitter overload reset, if required. Auxiliary contacts on S14T connect 115 VAC to the switching output terminal TS3T-7. The holding voltage for S14T passes through a normally-closed contact on the 2A OFF relay S15T, so that momentary operation of S15T will cause S14T to drop out. A strap connection is in series with S14T at TS1T-20 and -21, and may be replaced by an external normally-closed contact to remove plate voltage, or to prevent initial plate actuation.

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A similar control circuit exists for No. 2B ON and OFF, through relays S17T and S18T.

The positive holding voltage for S14T and S17T is designated "Failsafe B+" and is derived from contacts on the polarity control relays. Relays S1T through S4T each have a normally-open contact connected to the positive power supply voltage. These contacts are in parallel, and their output is thus present regardless of the control line polarity and resultant positions of the control relays. Should all control line voltage be absent; however, the circuit would open, and the 2A and 2B ON relays would drop out, thus causing the system to "failsafe". Capacitor C3.3T delays the removal of Failsafe B+, to prevent relay drop out during control relay switching. Failsafe B+ also appears at TS2T-14.

When the TRC-S terminal is switched off, the TRC-T unit may be used for control by switching D11T to LOCAL. A section of this switch effectively parallels the control relay failsafe contacts in this position, establishing holding voltage to S14T and S17T. Return to the REMOTE position removes the voltage, causing the relays to drop out.

K. 2A & 2B Report-Back. Pushbutton indicator E2S, at the studio terminal, contains two red lamps, which light to indicate that switching functions 2A and 2B have been switched on. At the transmitter terminal, two separate red pilots are mounted above and below the 2A and 2B switching designation strips. These are lighted directly from the switched device, with connections at TS1T-23 and -27. The lamps at the studio, however, must be lighted by report-back signals returned via the control telephone line.

Referring to the "Function Chart", note that with No. 2 switch D2S operated, the ring side of the control line is at zero potential. This line is used to return signals from the TRC-T unit during this period, which operate the 2A and 2B report relays S5S and S6S.

When the positive 2A or 2B ON control voltage appears at S14T or S17T, it is also connected to a "report-back" bus, via X29T or X30T. This voltage then appears on the ring side of the control line, through contact S8T-7-17, which is closed at this time. At the TRC-S unit, the signal passes through D2S-7-9, which is also closed, and then appears at TP7 or

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TP8, according to the position of SELECT B REPORT relay, S4S. Since the report-back signal is positive, it then appears on coil terminal 1 of S5S or S6S, causing the relay to pull in. The relay locks in through its own holding contact and lights the appropriate lamp in E2S.

Following the circuit path of the ring side of the control line, it is seen to connect through a series of normally closed relay contacts of S19T and S8T. If S8T is de-energized, the line then connects to the polarity control relays, as normal. When S8T is operated, however, the line connects to another series circuit, consisting of normally-closed contacts on S15T and S18T, finally appearing at the junction of X29T and X30T. When the 2A or 2B function is switched off, S15T or S18T is momentarily energized. Through the series contacts, the control line is then connected to SIGNAL B-, and a negative voltage appears on the line at the studio unit.

Since D2S is again operated, the voltage follows the same path as before, except in this case it is passed by diode X11S or X13S to relay coil terminal 4. If the function has previously been switched on, coil one will be energized. The momentary negative voltage on the second coil will produce an opposing magnetic flux to that already established, and the relay will drop out, extinguishing the indicator lamp.

Note that the OFF report-back signal will <u>not</u> extinguish the lamp should the function be switched off by the TRC-T unit controls, since it is necessary for D2S to first be operated.

L. <u>2A and 2B Overload Report.</u> In the preceding paragraph, it was shown that a negative voltage may be used to extinguish the studio indicator lamp when the function is manually switched off at the TRC-S unit. Functions 2A and 2B are normally assigned to plate voltage control, and since transmitter plate voltage may be unexpectedly removed on overload, a special circuit is used to transmit the "plate off" indication to the studio.

As S14T and S17T are energized, capacitors C3.1T and C3.2T are charged by the positive power supply voltage. Should an overload occur, interrupting the interlock connection at TS1T-20-21, or TS1T-24-25, the relay will drop out and the capacitor will discharge into S16T or S19T, momentarily energizing that relay. The contacts of these relays carry the series-connected control line, with the tip side connected

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through S16T and the ring side through S19T. When operated, these relays momentarily connect a negative "overload report" voltage to the respective side of the control line. Simultaneously, the portion of the control line connecting to the polarity control relays is transferred to the local positive power supply, maintaining the normal positive-positive line voltage condition at the TRC-T unit.

Since the normal control line voltage at the TRC-S unit is positive-positive, appearance of a negative voltage on the TRC-T unit control line will result in an above-average current flow in the line. This current will operate 2A or 2B OVERLOAD REPORT relay S1S or S2S, and its contacts will remove the holding voltage at S5S or S6S. The red 2A or 2B indicator lamp will then be extinguished, and the function must be manually switched on to restore normal operation.

Note that either 2A or 2B may signal an overload report, but that it is unlikely that both would signal simultaneously. This occurence would result in the normal circuit action at the TRC-S unit, but since it is expected to be rare, the simultaneous signal may be used for Fault Alarm signaling. (See Type TRC-FA3 Fault Alarm System instruction manual.) Because the usual Fault Alarm signals are of shorter duration, the delaying action of C1.2S and C1.3S prevents false operation of the 2A and 2B REPORT relays.

M. 6A and 6B Report-Back. The TRC-S unit is also equipped with red report-back lamps on switching functions 6A and 6B. These operate in a similar manner to the 2A and 2B report-back, except that the signals are returned over the tip side of the control line, which is at zero potential for this function. Red lamps are contained in E6S for this purpose, and light to indicate that functions 6A & 6B have been submitted on. Separate pilots are mounted on the TRC-T unit, to be lighted directly from the controlled device, with connections at TS2T-7 and -8.

Whereas the report-back circuitry is built into the TRC-T unit in the case of the 2A and 2B functions, the 6A and 6B report-back signals are provided by external relay units. Report-back Relay Unit Type 31125-B may be used for this purpose, and is connected to operate in parallel with the particular switching unit chosen to operate from functions 6A and 6B. The report-back unit carries contacts which are connected in series in place of the strap at TS2T-5 and -6, and which operate to momentarily connect the tip side of the control line

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to SIGNAL B+ or SIGNAL B-, available at TS2T-12 and -13.

At the TRC-S unit, the circuitry is similar to that for 2A and 2B, except that the report-back voltage is taken directly from D6S to the coils of S7S and S8S. The ground side of these relay coils is connected through the SELECT A REPORT relay, thus determining whether S7S or S8S will respond to the signal. Delay network R9Sand C3S prevents operation of the Report relays on spurious telephone line voltages.

S7S and S8S are bistable magnetic latching relays, which operate and hold when energized with a short voltage pulse. The voltage polarity determines the operating direction of the relay armature. In this application, a positive report-back voltage, signifying switching function ON, closes the relay armature, lighting the indicator lamp. A negative voltage opens the armature, and the contacts extinguish the lamp.

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INSTALLATION INSTRUCTIONS

NOTE: Before the Remote Control equipment is permanently installed, it is desirable to make a preliminary operational check by temporarily connecting both terminals at one location. This is usually done by temporarily locating the TRC-S unit at the transmitter site. The procedure discussed in Section 7 will familiarize operating personnel with the entire system, and will provide an initial check on equipment performance.

The TRC-3 equipment is constructed for installation on standard, 19 inch relay racks. The studio unit occupies an 8-3/4 inch panel space, and requires 9 inches of rack depth behind the front panel. The transmitter terminal is 12-1/4 inches high, and is 9 inches deep, overall. The equipment is installed as described in the following procedures:

Type TRC-S Studio Terminal

1. With front panel open, mount unit in standard 19 inch equipment rack, using the two Type 5938-A trim strips supplied. Center unit so that rack mounting screw heads do not project beyond front panel flange and prevent closure.

2. Refer to Schematic Diagram 31100-E.

3. Make telephone line connections at TS1S-1 through -4. (All terminal strips number consecutively from left to right.) Other terminal connections are discussed in Section 6.

4. Make a good ground connection (to cold water pipe or better) at TS1, terminal 5.

   NOTE: Both telephone lines must be balanced, metallic circuits. Repeat coils, relays, equalizing networks, etc., may not be used in either line.

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5. Connect line cord to 115 V AC power source.

6. The lamps and color filters for the lamp indicator units have been installed at the factory. Using the lamp removal tool packed with the unit, check to see that each lamp is firmly seated, and that each filter is in place.

7. The snap-on covers and clear plastic inserts for the indicators are shipped as loose items. After the various functions have been decided upon (see Section 8), the printed designations should be cut out and inserted in the snap-on covers.

> NOTE: Use extreme caution in installing and removing the transparent covers from the translucent screen, to avoid breaking the cover holding tabs. To remove a cover, the entire three-piece screen assembly should be removed from the indicator. Hold the assembly with the long dimension against a flat surface and exert sufficient pressure to force the two bottom tabs into the screen bottom groove. While holding the pressure, snap the cover off using a thin-blade knife at the top separation. The cover may be re-attached by reversing this process.

Type TRC-T Transmitter Terminal

1. With front panel open, mount unit in standard 19 inch equipment rack, using the two Type B31081 trim strips supplied. Center unit so that rack mounting screw heads do not project beyond front panel flange and prevent closure.

2. Refer to Schematic Diagram 31101-R.

3. Make telephone line connections at TS1T-1 through -4.

4. Make a good ground connection (to cold water pipe or better) at TS1T, terminal 5.

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5. Connect external metering circuits as desired at TS1T-7 through -19. All external circuits should be taken against ground, and should be capable of producing a minimum of +4.5 volts at the TRC-T input terminal when the particular function is selected by studio unit control.

6. Connect external switching units as desired at TS3T-3 through -28. Except for functions 2A and 2B, any of the standard auxiliary relay or motor units, or the customer's applique units may be connected at these terminals. Each pair of output terminals will deliver momentary voltages of 115 V AC, taken with respect to ground. The only requirement is that the auxiliary unit used must not draw excessive inrush current which might damage the control relay contacts. (See Section 10.)

7. Connect a separate source of 115 V AC at TS3T-1 and -2.

   CAUTION: This is to be a permanent connection and should be derived from a special transmitter building circuit, with a separate circuit breaker. Be sure to observe correct polarity in this connection.

8. Other terminal connections are discussed in Section 6.

9. Connect line cord to 115 V AC power source.

10. The lamps and color filters for the lamp indicator units have been installed at the factory. Using the lamp removal tool packed with the unit, check to see that each lamp is firmly seated, and that each filter is in place. (See Section 13.)

11. The snap-on covers and clear plastic inserts for the indicators are shipped as loose items. After the various functions have been decided upon (see Section 8), the printed designations should be cut out and inserted in the snap-on covers.

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Telephone Line Hum

After the installation over the permanent telephone lines has been completed, the TRC unit meters should be observed to indicate zero (with TRC-S unit power OFF and TRC-T unit in REMOTE.) If the meters are reading up-scale, it is likely that excessive AC hum exists on the metering telephone line. If it is determined no improvement may be made by interchanging the control and metering lines, it will be necessary to install external hum filters.

The telephone lines available today are usually quite well balanced, so that hum and noise pickup is usually eliminated across the telephone line pair. In some cases, however, several volts of hum may exist from each side of the line to ground. Although the TRC-3 metering circuit operates in an essentially balanced configuration, the series polarizing diodes used may rectify any appreciable AC voltage present on the telephone line with respect to ground, thus causing an error deflection on the meters.

The induced voltage on a telephone line is predominately a 60 cps sine wave, and thus lends itself well to filtering. The Type 31129-B Telephone Line Filter, shown in the drawings section, has been designed for this purpose, and may be constructed by the user, or obtained from Continental if required. The filter is essentially a pair of Bridge-T sections, and may be connected in series with the metering line at the input to the TRC-T unit. Since the metering signal is essentially balanced at the studio terminal, a similar filter is not usually required at that point. If the TRC-3 system is used with an accessory Type TRC-FA3 Fault Alarm System, the filter should be installed between the TRC-T and TRC-FA3-T units.

After being installed, the filter must be tuned to null at the interference frequency. The TRC-T unit meter may simply be nulled to zero, or an oscilloscope from J2T (and J4T) to ground may be used. If an oscilloscope is used, the waveforms at the filter input should first be observed. The filter has been factory tuned to null at 60 cps, but the unit should be retuned to resonance by first adjusting the screw on the end of L1, while observing the "tip" output at J2T. This adjustment has some inherent backlash, and the most sensitive point should be found after several back-and-forth motions. R1 should then be adjusted for minimum output. Tuning should be repeated using L2 and R2, observing the "ring" output. The four controls interact to some degree and repeated adjustments may be necessary.

The filter has an internal resistance of about 360 ohms in each side, and TRC-T unit controls R1T and R2T should each be decreased by that amount, to maintain the normal 8000 ohms loop resistance.

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USE OF THE VARIOUS TERMINAL CONNECTIONS

Several terminal strip connections are included on each unit, for connection to miscellaneous inputs, and for the operation of various external relays and custom auxiliary units. The use of each connection is discussed below.

Studio Terminal

(1) TS1S-1 through -6. Telephone line and ground connections.

(2) TS1S-7 through -9, -12 through -15. Used to connect external meters which may be switched into the metering line for particular functions.

(3) TS1S-10 and -11. These terminals permit actuation of external devices in sequence with the Select function. The terminals are normally grounded, with the ground removed for the particular Select group active at the time.

(4) TS1S-16 through -18. R11S and R12S may be replaced with external relays which may be polarized to detect when a particular line polarity is being transmitted. For example, Function 3 could be sensed at this point. In the connection of any external relays, power supply loading must remain constant, regardless of line polarity.

(5) TS1S-19 and -20. R19S is replaced by a relay in the TRC-FA3 Alarm System studio unit, when this system is used as an accessory.

(6) TS1S-21, -22 and -23. These outputs present pilot lamp and DC voltages for the control of external equipment. External loads should take into account the maximum rating of transformer T1S, as described in the Electrical Parts List. Also, these loads should not cause significant decreases in the DC voltages on the control line.

(7) TS1S-24, -25 and -26. R5S and R8S may be replaced with external relays to operate when functions 2A and 2B are switched. The positive voltages normally present at these terminals are removed when the switching functions are ON.

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Transmitter Terminal

(1) TS1T-1 through -6. Telephone line and ground connections.

(2) TS1T-7 through -19. Metering inputs.

(3) TS1T-20, -21 and -24, -25. 2A and 2B external interlocks, respectively. Each strap connection may be replaced by an external normally-closed circuit, which may be opened to prevent actuation of the switching function, or to interrupt the function previously switched ON, and thereby switching it OFF.

(4) TS1T-22 and -26. External relays may be connected at these points to reset transmitter overload circuits as the 2A and 2B functions are switched ON. (See Section 10 for relay recommendations.)

(5) TS1T-23 and -27. These terminals may connect to contacts on the 2 A and 2B switched devices, to control the local pilot lamps. The lamps will be lighted when ground is switched to these points.

(6) TS2T-1 and -2. R11T is replaced by the "Interrogate" relay in the Type TRC-FA3 Fault Alarm System, when that system is used as an accessory.

(7) TS2T-3 and -4. When the alarm system is used, it provides negative voltage at TS2T-3. This voltage reappears at TS2T-4 to operate the alarm system relay, and is removed when the TRC-T unit is operated to Local control.

(8) TS2T-5 and -6. These terminals connect to the Type 31125-B Report-Back Relay Units, when those units are used for report-back on functions 6A and/or 6B.

(9) TS2T-7 and -8. Contacts on the 6A and 6B switched devices may connect ground to these terminals, to light the local pilot lamps as these functions are switched ON.

(10) TS2T-9, -10 and -11. R49T and R50T may be replaced by external relays to be operated from theTRC-T unit positive and negative power supplies. It is suggested that the external loads be no less than 10,000 ohms each, to avoid excessive loading of the power supplies.

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(11) TS2T-12 and -13. SIGNAL B+ and SIGNAL B- voltages are available at this point for trouble-shooting, or for connection to external devices.

(12) TS2T-14 and -15. R48T may be replaced with an external relay circuit of similar resistance, to operate from the FAILSAFE B+ circuit.

(13) TS2T-17 through -23. These "auxiliary" output voltages, which may be positive or negative, appear when the respective metering function pushbutton is operated. They may be used to actuate an external relay circuit when the particular metering function is selected.

It should be noted that these voltages may also appear on a spurious basis as the control relay tree network switches between outputs. For this reason, any external relay circuit should include a slow-operate time delay circuit if short closures of the relay are undesirable. If the delay circuit includes a coil-shunting electrolytic capacitor, an isolating diode should be wired in series with the terminal output. This will avoid simultaneous delay of the TRC-T unit relay.

(14) TS2T-24. The voltage at this terminal appears when the Select function is switched to the Select B group. An external relay at this point may be used to sense the position of the Select relay.

(15) TS2T-25. 115 volts AC is present at this terminal in "Local" Control, and may be used to operate an external relay.

(16) TS3T-1 and -2. Input terminals for the 115 V AC switching circuit. Correct polarity must be observed at this connection.

(17) TS3T-3 through 28. Switching output connections.

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PRELIMINARY ADJUSTMENTS AND OPERATION

The operation of the Type TRC-3 Remote Control System has been covered in general by the preceeding sections. In addition, the following brief descriptions give recommended procedures for the most often used operations.

> CAUTION: Since the proper use of many of the switching and metering functions depends upon RC time delay circuits, it is essential to insert a slight pause between manual operations. Overly rapid operation may cause overlapping of some relay actions with resultant spurious and unwanted switching. In general, it is advisable to operate each pushbutton with a firm, sustained motion, and to pause one or two seconds between operations. Additionally, the operator should be sure to operate the ON/RAISE and OFF/LOWER pushbutton in the manner described below.

In order to become familiar with the system operation, it is advisable to make a temporary test connection of both units at one location. In this manner, with the entire system before the operator, it will be possible before installation to study the action of each of the circuits.

A. Starting the System. Operation of the studio unit POWER switch will energize the studio terminal, and will apply a positive-positive voltage to the control telephone line. The POWER and SELECT pushbuttons will light yellow, but all other pushbuttons will remain unlighted. An exception to this occurs if function 6A or 6B has previously been switched ON. In this case, the red lamp in the 6A or 6B pushbutton will be lighted.

In general, the action of the studio and transmitter unit controls is similar. Section 4 describes the overriding action of the TRC-T unit controls, and the action of the LOCAL/REMOTE switch. If system control is desired from the transmitter terminal with the studio power off, the TRC-T unit control switch is operated to LOCAL. All TRC-T control circuits are immediately active and all pushbuttons are illuminated.

B. Telephone Line Compensating Controls. The TRC-3 system is always operated over a telephone line loop resistance of 8000 ohms (in each of the two lines), regardless of the actual

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telephone line resistance in use. Potentiometers R1T through R4T are in series with the telephone lines, and are adjusted to make up the difference between 8000 ohms and the actual line resistance. They should be adjusted initially as follows:

(1) Disconnect the metering telephone line at TS1T-1 and -2. Connect an ohmmeter across J2T and J3T and adjust R1T for the difference between 4000 ohms and one-half the metering line measured loop resistance.

(2) Connect the ohmmeter across J4T and J5T and adjust R2T for the difference between 4000 ohms and one-half the metering line measured loop resistance. Reconnect the metering line.

(3) Connect a voltmeter from J6T to ground and adjust R3T for a reading of +40 volts.

(4) Connect the voltmeter from J7T to ground and adjust R4T for a reading of +40 volts.

Initial adjustment is now complete. Proper operation may be assured by periodically checking, and readjusting if necessary, the voltages at J6T and J7T.

(C) Function Selection. After the studio unit has been energized, the operator should immediately press the SELECT pushbutton to establish system synchronism and to illuminate the function pushbuttons. The SELECT button may be operated at any time, to change the system connections between the "A" and "B" group of functions.

D. Metering Circuit Calibration. On initial setup, the metering circuit should be calibrated by operating the studio pushbutton for function 4A (illuminated white), and adjusting the white knob for a 100% studio meter indication. At the TRC-T unit, the potentiometer above pushbutton 4 should be simultaneously adjusted for a 100% reading on the transmitter terminal meter. This latter adjustment should not require periodic rechecking, since its function is to compensate for differences in the two meters. The TRC-T unit adjustment may be made by switching to Local control and operating the 4A function from the TRC-T unit controls. For large initial differences in the meter readings, some interaction should be expected, and the studio reading should be rechecked.

Prior to each routine of reading and recording remote meter indications, the CALIBRATE position should be checked.

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If the TRC-T unit is on LOCAL control, removal of studio power will have no effect on the controlled functions. Subsequent return to REMOTE control, however, will result in a similar shutdown to that described above.

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FUNCTION ASSIGNMENTS

As explained in the preceding sections, the control of the metering and switching positions is similar and, with only a few exceptions, any function may be assigned to any position. In metering, position 4A is always reserved for CALIBRATE, but all other inputs are identical and may be assigned at will. All switching outputs are identical except for positions 2A and 2B, and may be assigned as desired. Since 2A and 2B are sustained rather than momentary outputs, and are interlocked with the Failsafe circuit, these are normally reserved for plate voltage control. Additionally, functions 6A and 6B differ in that they include provisions for report-back lamp indication at the studio. All other switching assignments may be made as desired.

The illustrations in Section 2 show an assignment of functions that could be considered typical of a system for the control of two transmitters. The actual assignments decided upon, may differ radically from this sample, depending on individual station requirements. It should be noted, however, that metering and switching functions should be paired logically, whenever possible. In the illustration, for instance, function 1A is assigned to meter the filament voltage of transmitter 1, while the 1A switching function controls these filaments. The operator thus has a logical check on the proper operation of the switching function, by referring to the companion metering position.

To aid in the selection of functions for particular requirements, the chart on the next page may be used to record the assignments chosen. In some cases, based on previous experience, the factory will make suggested assignments on the sheets supplied with the equipment. These may be reassigned as desired by the customer.

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FUNCTION ASSIGNMENT SHEET

							Group A Switching
1A	2A	3A	4A	5A	6A	7A	
							Group A Metering
							Group B Metering
1B	2B	3B	4B	5B	6B	7B	
							Group B Switching

REMARKS:

Station_____

Date_____

FUNCTION DESIGNATION

The lighted pushbuttons are arranged to accept printed or typed designation labels. These may be thin tissue or tracing paper, but best light transmission obtains through the use of transparent film.

The next page of this section is a reproduction of the transparent designation sheet which is supplied with each system. The sheet contains a number of function titles which will fit many requirements, plus others specified for certain customers which may be useful in other instances. The user should cut out the desired designations and insert them in the indicator screen assemblies in the preferred order.

Note that the designation sheet has two sets of horizontal lines on each side of the page. These will serve as guides for cutting out the titles, and the user should select either the upper or lower guide lines for a particular row of titles, depending on whether the title is to appear in the upper or lower half of the pushbutton. It is important that the film title be cut so as to occupy the full space inside the transparent cap, although only half the film will carry a title. Two films are normally cut for each pushbutton, to be placed one over the other within the transparent cap.

Several blank spaces are provided on the film, in which custom titles may be lettered by the user. After surface degreasing with an agent such as Pounce, a LeRoy and other similar lettering set may be used directly on the film.

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FILAMENT VOLTAGE	FILAMENT VOLTAGE 1	FILAMENT VOLTAGE 2	PA FILAMENT VOLTAGE	CONTROL VOLTAGE	LINE VOLTAGE	LINE VOLTAGE PHASE 1-2	LINE VOLTAGE PHASE 1-3
PLATE CURRENT	PLATE CURRENT 1	PLATE CURRENT 2	PA PLATE CURR	TOTAL PLATE CURR	MODULATOR PLATE CURR	DRIVER PLATE CURRENT	EXCITER PLATE CURRENT
PLATE VOLTAGE	PLATE VOLTAGE 1	PLATE VOLTAGE 2	PA PLATE VOLT	DRIVER PLATE VOLT	EXCITER PLATE VOLT	OUTPUT POWER	REFLECTED POWER
ANTENNA CURRENT	REGULAR ANTENNA CURR	EMERGENCY ANTENNA CURR	AUXILIARY ANTENNA CURR	CONELRAD ANTENNA CURR	LINE CURRENT	EXCITER OUTPUT	EXCITATION
COMMON POINT CURRENT	NIGHT COMM POINT CURR	DAY COMM POINT CURR	BASE CURRENTS	TOWER 1 BASE CURRENT	TOWER 2 BASE CURRENT	TOWER 3 BASE CURRENT	TOWER 4 BASE CURRENT
PROGRAM LINE	TRANSMITTER PROGRAM INPUT	PROGRAM LINE/FM	LOOP CURRENTS	TOWER 1 LOOP CURRENT	TOWER 2 LOOP CURRENT	TOWER 3 LOOP CURRENT	TOWER 4 LOOP CURRENT
TOWER LIGHT CURRENT	REGULAR TOWER LIGHT CURR	EMERG TOWER LIGHT CURR	AUX TOWER LIGHT CURR	TOWER 1 LIGHT CURR	TOWER 2 LIGHT CURR	TOWER 3 LIGHT CURR	TOWER 4 LIGHT CURR
TOWER BEACON CURRENT	TOWER SIDE LIGHTS CURR	TOWER1-2 LIGHT CURR	TOWER 3-4 LIGHT CURR	TEMPERATURE	TRANSMITTER TEMPERATURE	BUILDING TEMPERATURE	WATER TEMPERATURE
GENERATOR VOLTAGE	EMERGENCY GENERATOR	PERCENT MODULATION	FREQUENCY DEVIATION	MAIN TRANSMTR	MAIN TRANSMTR	AUX TRANSMTR	AUX TRANSMTR
PHASE 1-2	PHASE 1-3	PHASE 1-4	PHASE 2-3	PHASE 2-4	PHASE 3-4		
POWER	SELECT	CALIBRATE	ON RAISE	OFF LOWER	REMOTE LOCAL		PATTERN CHANGE

USE INSIDE GUIDES FOR TITLE IN UPPER HALF OF BUTTON.
USE OUTSIDE GUIDES FOR TITLE IN LOWER HALF OF BUTTON.

METERING DESIGNATIONS

TYPE TRC-3 REMOTE CONTROL SYSTEM

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STANDARD ACCESSORY UNITS

A number of standard accessory units are available from the factory to satisfy most requirements for external switching and metering. These units are listed below by type number, and a brief description is given for each. Schematic diagrams of the more commonly used devices are included in the Drawings Section.

In addition to the factory available auxiliary relay units, the customer may wish to construct custom relay devices to be driven from the TRC-T unit, for special requirements. Any relays or other devices used, other than those recommended below, should be checked to make sure their AC inrush currents are not excessive for TRC-T unit control relay contact ratings. Also, extremely large contactors which would create excessive arcing at the control relay contacts as their coil voltages were interrupted, should be avoided. If large contactors must be used in order to obtain proper contact capacity for the circuit to be operated, it is better to repeat the control circuit through a small relay, which may be safely operated from the TRC-T unit.

In general, any 115 V AC relay or contactor may be used, providing that its initial inrush rating does not exceed 120 VA. (Steady-state rating for such contactors will be about 20 VA.) All relays specified below will be within these maximum ratings. Arc suppression circuits within the TRC-T unit have been designed to efficiently suppress arcing at the control relay contacts, when relays of the recommended types are used.

In referring to the relay unit drawings, it is seen that the relay coil common circuits are to be returned to TS3T-2. It is, of course, impractical to connect fifteen wires at the single terminal point, and for large system installations, an external common connection should be installed to accept these wires.

Switching Units

(1) Type 31121-B Mechanical Latching Auxiliary Relay Unit. Mechanically held 4PDT contacts rated for 10 amperes, 115 V AC, non-inductive loads.

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(2) Type 31122-B Electrical Latching Auxiliary Relay Unit. Electrically held DPDT contacts rated for 10 amperes, 115 V AC, non-inductive loads.

(3) Type 31123-B Momentary Output Auxiliary Relay Unit. Separate momentarily operated DPDT contacts for the ON and for the OFF outputs are rated at 15 amperes, 115 V AC, non-inductive loads.

(4) Type 31124-B Motor and Clutch Assembly. Reversible motor operating directly from the TRC-T unit, rated at 2.8 RPM, 95 in-oz. Included is an adjustable slip-clutch and flexible coupling to the driven device, which is not supplied.

NOTE: Other speed and torque ratings available on special order.

(5) Type 31125-B Report-Back Relay Unit. This unit may be connected to operate in parallel with the relay device chosen to operate from functions 6A or 6B. It is used to provide a report-back signal to the studio, to indicate that the particular switching function has been operated. Two units may be used per system.

(6) Type 31126-B Program Line Reversing Unit. A special mechanical-latching relay unit, used to change transmitter inputs between the main and spare program lines. Includes a built-in battery to produce a studio metering indication according to the position (normal or reversed) of the program lines.

Separate Relays. The following relays are available as loose items and are recommended for use with the TRC-3 system.

(1) Ohmite DOSX-7T, 115 V AC coil, DPDT 15 ampere, 115 V AC non-inductive contacts.

(2) Ohmite DOSX-59T, 110 V DC Coil, DPDT 15 ampere, 115 V AC non-inductive contacts. Recommended for overload reset, or for auxiliary DC circuits.

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(3) *RBM 101130-101 Industrial Contactor, 115 V AC coil, 3PNO reversible contacts, rated 10 amperes, non-inductive, at 115 V AC.

(4) *RBM 101150-101 Industrial Contactor, 115 V AC coil, 5PNO reversible contacts, rated 10 amperes, non-inductive, at 115 V AC.

NOTE: Items (3) and (4) available with 230 V AC coils on special order. 15 ampere reversible and 25 ampere normally-open contact versions are also available on special order.

(5) *Allen-Bradley 700BXL440A Industrial Mechanical-Latching Contactor, 115 V AC coil, 4PNO and 4PNC contacts, rated 10 amperes, non-inductive, 600 V AC. Also available with 230 volt coil, on special order. Specify coil voltage with all orders.

*These contactors are also available in separate steel enclosures, on special order.

Metering Units

(1) Type B31099-1 Antenna Current Metering Unit. Connects in series with transmission line, and produces rectified DC sample proportional to R F current. For currents of 0 to 15 amperes R F. No AC power required.

(2) Type B31099-2 Antenna Current Metering Unit. Same as Type B31099-1, except for currents above 15 amperes R F.

(3) Type 5522-A Tower Lights Metering Unit, with #10775 Current Transformer. Toroidal transformer uses tower lights circuit wiring as primary. Unit produces DC sample proportional to current.

(4) Type 31128-B Line Voltage Metering Unit. May be used with 115 V AC or 230 V AC circuits to produce a DC sample proportional to voltage. Also recommended for filament voltage metering by connecting across primary of filament transformer.

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SPECIAL PURPOSE ACCESSORY UNITS

From time to time custom accessory units are designed for use at particular stations. Such units, if any, are described in the following pages of this section. Special drawings, if required, are inserted at the back of the Drawings Section.

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INTERCONNECTION TO PARTICULAR TRANSMITTERS

In some cases, the factory will suggest special connections to be made between the TRC-T unit and transmitter in use at a particular station. Installation description sheets for this purpose are found in this section, if required.

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MAINTENANCE AND SPARE PARTS

The TRC-3 system requires little periodic maintenance, because of the use of hermetically-sealed relays in most positions. The control and a few other relays are of the dust-covered type, but a regular program of cleaning and contact maintenance will assure them of long life.

The dust-covered telephone-type relays used in the TRC-3 system are as maintenance-free as relays can be. Because of the difference in flexing lengths between the armature and stationary springs, the contacts are self-cleaning. The difference in direction of spring movement, plus the twin contacts employed, results in a wiping action sufficient to break through a film of dust or dirt. The main problem will be to keep the relays clean. All bearing pins are packed with grease and should never require relubrication. The relays should never require readjustment. Do not readjust a relay until certain that it is out of its allowable operating range.

The avoidance of adjustment until absolutely necessary is emphasized because of the interaction of adjustments which can easily result in a relay being less able to operate properly than before. Particularly in the case of the polarity control relays, the close-differential adjustment necessary for reliable system operation would be difficult to duplicate in the field.

To clean the relay contacts, use only a contact cleaning tool such as Automatic Electric Cleaner H-42962-1, or Western Electric Burnishing Tool 265C. Do not use paper or cloth, as they will leave dust or lint on the contacts. Do not use any liquid cleaners, because they leave an oily residue which will only collect more dirt. Never use crocus cloth on relay contacts.

Occasionally, a thorough general cleaning of all the relays may be necessary. Using a vacuum cleaner and an ordinary paint brush, stir up the dust with the brush and draw it up with the vacuum cleaner hose, held as close as possible to the relays. Clean the coil and other relay parts before cleaning the springs. When cleaning the springs, insert the brush bristles into the spring pile-up near the insulators, and draw them out through the contacts. Operate the armature by hand to clean both make and break contacts, and use contact cleaner H-42962-1 on them, as previously described. If both

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these methods fail to remove deposits caused by arcing, they can be removed with a piece of fine, dry chamois stretched over a very thin piece of wood or metal and drawn through the contacts. If chamois is used, give the contacts a final cleaning with the cleaning tool.

The Type 328 lamps used in the indicator assemblies have an average life of 500 hours at rated voltage. By operation at reduced voltage in the system, their average life rating has been extended to 4000 hours. The 328L lamp (Chicago Miniature Lamp Works) has an average life of 3000 hours at rated voltage, which is proportionally extended by operation at reduced voltage. The Types 328 and 328L have equivalent luminous intensities, and may be used interchangeably.

New filters and lamps are installed as follows, using tool No. 15PA32, supplied with the system:

> The filter should be applied to the bulb before insertion of the lamp. The combination may then be inserted by grasping either the base or the glass portion of the lamp with the tool, and pushing it into the socket. The filters may be removed from the lamps by gently grasping with the lamp tool. After filter removal, the lamps themselves are removed by inserting the tool completely into the socket alongside the lamp base until the tool tips, which act as stops, bottom on the plastic housing. The tool should be inserted with its legs parallel to the indicator unit axis. Insertion at an angle, or twisting the lamp with the tool, may damage the socket prongs.

Recommended Spare Parts

Quantity	Description
4	Diode, 1N2071
2	Diode, 1N971A
1	Diode, 1N748
2	Filter, Red, 2G5

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2	Filter, Yellow, 2G6
2	Filter, Green, 2G7
10	Fuse, 1 Amp., 3 AG
6	Lamp, 328
2	Lamp, L10010R
2	Relay, CR2791G122AL1, CEMC Spec. 10705-C
1	Relay, LS4331-2, CEMC Spec. 10772-D
1	Relay, PP6681-1, CEMC Spec. 10849-A
1	Relay, PB3040-96, CEMC Spec. 10850-B
1	Relay, LS4400-1, CEMC Spec. 10854-B
2	Relay, 3SAA1004, CEMC Spec. 10875
1	Relay, 3SAM1068, CEMC Spec. 10876
1	Switch, 2D2
1	Switch, 2D5
1	Switch, 2D26
1	Contact Cleaner, H-42962-1

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30233

UNIT TRC-S Studio Terminal | REF. DWG. NO. 31100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
C1.1S	Positive Filter	Capacitor	50-25-25 mfd., 400 V, electrolytic, 1-3/8 x 3" can	TS-17040	Mallory
C1.2S	#2A Report Delay	Capacitor			
C1.3S	#2B Report Delay	Capacitor			
C2S	Negative Filter	Capacitor	50 mfd., 350 V., electrolytic, 1 x 2-1/2", with fibre insulating sleeve #CE-7	FP 137	Mallory
C3S	#6 Report Delay	Capacitor	2 mfd., 100 WVDC, tubular	WMF1W2E	Cornell-Dubilier
D1S	#1 Operate	Switch	Momentary action switch unit, 3 PDT	2D5	Micro Switch
D2S	#2 Operate	Switch	Same as D1S		Micro Switch
D3S	#3 Operate	Switch	Same as D1S		Micro Switch
D4S	#4 Operate	Switch	Same as D1S		Micro Switch
D5S	#5 Operate	Switch	Same as D1S		Micro Switch
D6S	#6 Operate	Switch	Same as D1S		Micro Switch
D7S	#7 Operate	Switch	Same as D1S		Micro Switch
D8S	Select	Switch	Momentary action switch unit, DPDT	2D2	Micro Switch
D9S	On/Raise	Switch	Same as D1S		Micro Switch
D10S	Off/Lower	Switch	Same as D1S		Micro Switch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30233

UNIT TRC-S Studio Terminal | REF. DWG. NO. 32100-B ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
D11S	Power	Switch	Alternate action switch Unit, DPDT	2D26	Micro Switch
E1S	#1 Indicator	Lamp Assembly	#2C3 operator-indicator with four #328 lamps, one #2A65 three piece split screen, four #2G7 green filters, and one 2B1 gray barrier.	2C3	Micro Switch
E2S	#2 Indicator	Lamp Assembly	#2C3 operator-indicator, with four #328 lamps, one #2A65 three-piece split screen, two #2G7 green filters, two #2G5 red filters, and one #2B1 gray barrier.	2C3	Micro Switch
E3S	#3 Indicator	Lamp Assembly	Same as E1S		Micro Switch
E4S	#4 Indicator	Lamp Assembly	Same as E1S except with only two #2G7 green filters	2C3	Micro Switch
E5S	#5 Indicator	Lamp Assembly	Same as E1S		Micro Switch
E6S	#6 Indicator	Lamp Assembly	Same as E2S		Micro Switch
E7S	#7 Indicator	Lamp Assembly	Same as E1S, except with one additional #2B1 gray barrier	2C3	Micro Switch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30233

UNIT TRC-S Studio Terminal | REF. DWG. NO. 31100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
E8S	Select Indicator	Lamp Assembly	#2C1 operator-indicator with one #2A70 three-piece screen, two #2G6 yellow filters, two #328 lamps and two #2B1 gray barriers	2C1	Micro Switch
E9S	On/Raise	Lamp Assembly	#2C9 operator-indicator, with #2A70 three-piece, four #328 lamps and four #2G6 yellow filters and one #2B2 gray barrier.	2C9	Micro Switch
E10S	Off/Lower	Lamp Assembly	Same as E9S, except with one additional #2B2 gray barrier.	2C9	Micro Switch
E11S	Power	Lamp Assembly	Same as E8S		Micro Switch
F1S	Primary Protection	Fuse	Holder, with #312001, 1 amp. fuse	342003	Little-Fuse
J1S	Power Input	Socket	With unilectric #18-2-SJ power cord	GE-2711	Graybar
M1S	Percent of Normal	Meter	Simpson model 1329, 0-200 dc microammeter, per CEMC Spec. #10774-A	1329	Simpson
R1S	Positive Dropping	Resistor	50 ohm, 10 watt, wirewound		Ohmite

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-S Studio Terminal

ELECTRICAL PARTS LIST NO. 30233

REF. DWG. NO. 21100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO	MANUFACTURER
R2S	Negative Dropping	Resistor	Same as R1S		Ohmite
R3S	S3S Loading	Resistor	12K ohms, 2 watts, ± 10%, composition		Ohmite
R4S	S3S Dropping	Resistor	3300 ohms, 2 watts, ± 10%, composition		Ohmite
R5S	S6S Loading	Resistor	18K, 2 watts, ± 10%, composition		Ohmite
R6S	S6S Dropping	Resistor	10 K, 2 watts, ± 10%, composition		Ohmite
R7S	S5S Dropping	Resistor	Same as R6S		Ohmite
R8S	S5S Loading	Resistor	Same as R5S		Ohmite
R9S	Dropping	Resistor	Same as R3S		Ohmite
R10S	Not Used		Not Used		
R11S	Line Loading	Resistor	Same as R6S		Ohmite
R12S	Line Loading	Resistor	Same as R6S		Ohmite
R13S	Lamp Dropping	Resistor	2.2 ohms, 2 watt, ± 10%, wire wound	BW-2	IRC
R14S	Lamp Dropping	Resistor	0.25 ohm, 25 watts, ± 3%	PH-25	Dale Products

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-S Studio Terminal

ELECTRICAL PARTS LIST NO. 30233

REF. DWG. NO. 31100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
R15S	Meter Shunting	Resistor	1800 ohms, 1/2 watt, ± 10%, composition		Ohmite
R16S	Calibrate	Potentiometer	5000 ohms, ± 20%, Linear, 2 w., Type "J", with one #M3462 Mounting Washer	JA1L056S502MC	Allen-Bradley
R17S	Loading	Resistor	Same as R3S		Ohmite
R18S	S4S Dropping	Resistor	Same as R4S		Ohmite
R19S	Fault Alarm Terminate	Resistor	Same as R3S		Ohmite
R20S	Positive Limiting	Resistor	1200 ohms, 10 watts, wire-wound		Ohmite
R21S	Positive Bleeder	Resistor	Same as R5S		Ohmite
R22S	Negative Bleeder	Resistor	Same as R6S		Ohmite
R23S	Negative Limiter	Resistor	Same as R20S		Ohmite
R24S	S1S Shunting	Resistor	470 ohms, 1 watt, ± 10%		Ohmite
R25S	S2S Shunting	Resistor	Same as R24S		Ohmite
R26S	S5S Delay	Resistor	15 K, 2 watt, ±10%, composition		Ohmite
R27S	S6S Delay	Resistor	Same as R26S		Ohmite

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30233

UNIT TRC-S Studio Terminal | REF. DWG. NO. 31100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
S1S	#2A Overload Report	Relay	250 ohm coil, to pull in at 25 ma or less, SPDT contacts, per CEMC Spec. #10772-D	LS4331-2	Potter-Brumfield
S2S	#2B Overload Report	Relay	Same as S1S		Potter-Brumfield
S3S	Select A Report	Relay	7000 ohm coil, 4 PDT contacts, per CEMC Spec. No. 10705-C	CR2791G122AL1	General Electric
S4S	Select B Report	Relay	Same as S3S		General Electric
S5S	#2A Report	Relay	Series EQA, with 6500-6500 ohm double wound coil, 120V DC, and with two DPNO and one SPDT contacts, per CEMC Spec. #10849-A	PP 6681 -1	Automatic Electric
S6S	#2B Report	Relay	Same as S5S		Automatic Electric
S7S	# 6A Report	Relay	Magnetic Latching, 8200 ± 20% ohms single coil, DPDT contacts, per CEMC Spec. #10876	3SAM1068	General Elec.
S8S	#6B Report	Relay	Same as S7S		

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-S Studio Terminal

ELECTRICAL PARTS LIST NO. 30233

REF. DWG. NO. 31190-B ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO	MANUFACTURER
T1S	Power	Transformer	140-120-0-120-140 volts at 150 ma.; 6.3 V.C.T. at 5 amps.	A8081	ADC
TS1S	Connecting	Terminal Strip		440Y-28	General Products
VS1S	S1S Relay	Socket	7 pin, miniature, mica-filled bakelite, bottom mount	116PH	Elco
VS2S	S2S Relay	Socket	Same as VS1S		Elco
VS3S	S3S Relay	Socket	14 pin miniature, mica-filled bakelite, bottom mount	699PHSPTD	Elco
VS4S	S4S Relay	Socket	Same as VS3S		Elco
VS5S	S5S Relay	Socket	14 pin miniature, mica-filled bakelite, top mount	54A16640	Cinch
VS6S	S6S Relay	Socket	Same as VS5S		Cinch
VS7S	S7S Relay	Socket	8 solder-cup contacts, for below-chassis mount, .093" chassis, with stainless steel mounting hardware	HRT-313	Armel
VS8S	S8S Relay	Socket	Same as VS7S		Armel
VS9S	C1S Capacitor	Socket	4 pin, black bakelite, bottom mount	2C7	Cinch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30233

UNIT TRC-S Studio Terminal | REF. DWG. NO. 31100-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
VS10S	C2S Capacitor	Socket	3 pin, black bakelite, bottom mount	2C5	Cinch
X1S	Positive Power Supply	Diode	750 ma, 600 P.I.V., silicon	IN2071	Texas Instruments
X2S	Negative Power Supply	Diode	Same as X1S		Texas Instruments
X3S	Meter Protection	Diode	Same as X1S		Texas Instruments
X4S	Meter Protection	Diode	Same as X1S		Texas Instruments
X5S	Metering Line Polarizing	Diode	Same as X1S		Texas Instruments
X6S	S3S Polarizing	Diode	Same as X1S		Texas Instruments

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-S Studio Terminal

ELECTRICAL PARTS LIST NO. 30233

REF. DWG. NO. 31109-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
X7S	S4S Polarizing	Diode	Same as X1S		T I
X8S	S4S Biasing	Diode	3.9 volt Zener	IN748	Motorola
X9S	S3S Biasing	Diode	Same as X8S		Motorola
X10S	S5S On	Diode	Same as X1S		T I
X11S	S5S Off	Diode	Same as X1S		T I
X12S	S6S On	Diode	Same as X1S		T I
X13S	S6S Off	Diode	Same as X1S		T I
X14S	Positive Regulating	Diode	75 volt, 10 watt, Zener (X14S and X15S matched at CEMC with 3 volts, at 30 ma Test Current)	IN3002A	Motorola
X15S	Negative Regulating	Diode	75 volt, 10 watt, Zener, Reverse polarity (See note above)	IN3002RA	Motorola
Z1	Lamp and Filter	Tool		15PA32	Micro Switch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO	MANUFACTURER
C1T	Positive Filter	Capacitor	50 Mfd., 350 V., electrolytic, 1 x 2-1/2", with fibre insulating sleeve, #CE-7	FP 137	Mallory
C2T	Negative Filter	Capacitor	Same as C1T		Mallory
C3.1T	Overload Report 1	Capacitor	40-40-30-10 mfd., 450-450-450-200 V., electrolytic, 1-3/8 x 4"	FP 432-4	Mallory
C3.2T	Overload Report 2	Capacitor			
C3.3T	Failsafe B/ Delay	Capacitor			
C3.4T	Line Bypass	Capacitor			
C4T	Metering Bypass	Capacitor	20 mfd., 250 V, electrolytic, 13/16" x 1-3/4"	TC-55	Mallory
C5T	Not Used		Not Used		
C6T	Not Used		Not Used		
C7T	Not Used		Not Used		
C8T	Bypass	Capacitor	0.005 mfd., 500 DCWV, 1 KV Test, 0.385" diameter	CG	Centralab
C9T	Bypass	Capacitor	Same as C8T		Centralab
C10T	Bypass	Capacitor	Same as C8T		Centralab

Revised 6-7-61
7-17-61

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO	MANUFACTURER
C11T	Bypass	Capacitor	Same as C8T		Centralab
C12T	Bypass	Capacitor	Same as C8T		Centralab
C13T	Bypass	Capacitor	Same as C8T		Centralab
C14T	Bypass	Capacitor	Same as C8T		Centralab
C15T	Bypass	Capacitor	Same as C8T		Centralab
C16T	Bypass	Capacitor	Same as C8T		Centralab
C17T	Bypass	Capacitor	Same as C8T		Centralab
C18T	Bypass	Capacitor	Same as C8T		Centralab
C19T	Bypass	Capacitor	Same as C8T		Centralab
C20T	Bypass	Capacitor	Same as C8T		Centralab
C21T	Arc Suppression	Capacitor	0.25 mfd., 600 V	MP6P25	Cornell-Dubili
C22T	Arc Suppression	Capacitor	Same as C21T		Cornell-Dubilier
C23T	Arc Suppression	Capacitor	0.1 mfd., 600 V	MP6P1	Cornell-Dubilier
C24T	Arc Suppression	Capacitor	Same as C23T		Cornell-Dubilier
D1T	#1 Auxiliary	Switch	Momentary Action Switch, DPDT	2D2	Micro Switch
D2T	#2 Auxiliary	Switch	Same as D1T		Micro Switch
D3T	#3 Auxiliary	Switch	Same as D1T		Micro Switch
D4T	#4 Auxiliary	Switch	Same as D1T		Micro Switch
D5T	#5 Auxiliary	Switch	Same as D1T		Micro Switch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
D6T	#6 Auxiliary	Switch	Same as D1T		Microswitch
D7T	# 7 Auxiliary	Switch	Same as D1T		Microswitch
D8T	Select	Switch	Same as D1T		Microswitch
D9T	On/Raise	Switch	Momentary Action Switch, 3 PDT	2D5	Microswitch
D10T	Off/Lower	Switch	Same as D9T	2D5	Microswitch
D11T	Local/Remote	Switch	Alternate Action Switch Unit, 4PDT	2D33	Microswitch
E1T	#1 Auxiliary	Lamp Assy.	#2C3 Operator Indicator Unit with one 2B1 Gray barrier, #2A65 3-piece white split screen, four #328 Lamps, & four #2G7 green filters	2C3	Microswitch
E2T	#2 Auxiliary	Lamp Assy.	Same as E1T		Microswitch
E3T	#3 Auxiliary	Lamp Assy.	Same as E1T		Microswitch
E4T	#4 Auxiliary	Lamp Assy.	Same as E1T		Microswitch
E5T	#5 Auxiliary	Lamp Assy.	Same as E1T		Microswitch
E6T	#6 Auxiliary	Lamp Assy.	Same as E1T		Microswitch
E7T	#7 Auxiliary	Lamp Assy.	Same as E1T, except to include one additional #2B1 Gray barrier		Microswitch

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
E8T	Select	Lamp Assy.	#2C1 Operator-Indicator Unit, with two #2B1 Gray barriers, two #328 Lamps, two #2G6 Yellow filters, and #2A70 3-piece white screen	2C1	Microswitch
E9T	On/Raise	Lamp Assy.	#2C9 Operator-Indicator Unit with one #2B2 Gray barrier, four #328 Lamps, four #2G6 Yellow filters, and #2A70 3-piece white screen	2C9	Microswitch
E10T	Off/Lower	Lamp Assy.	Same as E9T, except to include one additional #2B2 gray barrier	2C9	Microswitch
E11T	Local/Remote	Lamp Assy.	#2C3 Operator-Indicator unit with two #2B1 Gray barriers, four #328 Lamps, four #2G6 Yellow filters, & #2A65 3-piece white split screen	2C3	Microswitch
E12T	#2A On	Lamp	Red Pilot, 6.3 VAC, Stainless body	L10010R	Electrosnap
E13T	#2B on	Lamp	Same as E12T		Electrosnap
E14T	#6A On	Lamp	Same as E12T		Electrosnap
E15T	#6B On	Lamp	Same as E12T		Electrosnap
F1T	Primary Protection	Fuse	Holder with #312001, 1 amp., Fuse	342003	Littlefuse
F2T	115 VAC Switching Input	Fuse	Same as F1T		Littlefuse

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-T Transmitter Terminal

ELECTRICAL PARTS LIST NO. 30232

REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
J1T	Power Input	Socket	With Unilectric #18-2-SJ Power cord	GE-2711	Graybar
J2T	Test	Jack	Standard Metal-clad Nylon tip Jack, black	105-253-1	E. F. Johns
J3T	Test	Jack	Same as J2T		E.F. Johnso
J4T	Test	Jack	Same as J2T		E.F. Johnso
J5T	Test	Jack	Same as J2T		E.F. Johnso
J6T	Test	Jack	Same as J2T		E.F. Johnso
J7T	Test	Jack	Same as J2T		E.F. Johnso
M1T	Percent of Normal	Meter	Simpson Model 1329, 0-200 DC Microammeter, per CEMC Specification #10774-A	1329	Simpson
R1T	Line 1 Series	Potentiometer	5000 ohm, ±20%, Linear, 2 w., Type "J", with one #M3462 Mounting Washer	JA1L056S502MC	Allen-Bradley
R2T	Line 1 Series	Potentiometer	Same as R1T		Allen-Bradley

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
R3T	Line 2 Series	Potentiometer	Same as R1T		Allen-Bradley
R4T	Line 2 Series	Potentiometer	Same as R1T		Allen-Bradley
R5T	Lamp Dropping	Resistor	3.3 ohms, 2 w., ±10%, wire-wound	BW-2	I R C
R6T	Dropping	Resistor	3900 ohms, 2 w., ± 10% composition		Ohmite
R7T	Surge	Resistor	100 ohms, 2 w., ±10% composition		Ohmite
R8T	Surge	Resistor	Same as R7T		Ohmite
R9T	Dropping	Resistor	12 K ohms, 2 w., ± 10% composition		Ohmite
R10T	Dropping	Resistor	Same as R9T		Ohmite
R11T	Interrogate Load	Resistor	240 ohms, 1 w., ± 5% composition		Ohmite
R12T	Lamp Dropping	Resistor	Same as R5T		I RC
R13T	Calibrate Shunt	Resistor	6800 ohms, 1/2 w., ± 10%, composition		Ohmite
R14T	Calibrate Series	Resistor	330 ohms, 1/2 w., ± 10%, composition		Ohmite
R15T	Positive Dropping	Resistor	50 ohm, 10 w., Brown Devil		Ohmite
R16T	Negative Dropping	Resistor	Same as R15T		Ohmite

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-K ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
R17T	Positive Bleeder	Resistor	18 K ohms, 2 watt, ±10% composition		Ohmite
R18T	Negative Bleeder	Resistor	3500 ohms, 25 w., ± 3%	PH-25	Dale Products
R19T	Lamp Dropping	Resistor	10 ohms, 2 w., ± 10%		Ohmite
R20T	Lamp Dropping	Resistor	0.5 ohm, 25 w., ± 3%	PH-25	Dale Products
R21T	#1A Metering	Potentio-meter	Type G, 10 K ohm linear, 1/2 w., ±20%	GA4L640S103MC	Allen-Bradley
R22T	#1B Metering	Potentio-meter	Same as R21T		Allen-Bradley
R23T	#2A Metering	Potentio-meter	Same as R21T		Allen-Bradley
R24T	#2B Metering	Potentio-meter	same as R21T		Allen-Bradley
R25T	#3A Metering	Potentio-meter	Same as R21T		Allen-Bradley
R26T	#3B Metering	Potentio-meter	Same as R21T		Allen-Bradley
R27T	Calibrate Adj.	Potentio-meter	Same as R21T		Allen-Bradley
R28T	#4B Metering	Potentio-meter	Same as R21T		Allen-Bradley
R29T	#5A Metering	Potentio-meter	Same as R21T		Allen-Bradley

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-B ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
R30T	#5B Metering	Potentiometer	Same as R21T		Allen-Bradley
R31T	#6A Metering	Potentiometer	Same as R21T		Allen-Bradley
R32T	#6B Metering	Potentiometer	Same as R21T		Allen-Bradley
R33T	#7A Metering	Potentiometer	Same as R21T		Allen-Bradley
R34T	#7B Metering	Potentiometer	Same as R21T		Allen-Bradley
R35T	S7T Dropping	Resistor	Same as R6T		Ohmite
R36T	S8T Dropping	Resistor	Same as R6T		Ohmite
R37T	S9T Dropping	Resistor	Same as R6T		Ohmite
R38T	S10T Dropping	Resistor	Same as R6T		Ohmite
R39T	S11T Dropping	Resistor	Same as R6T		Ohmite
R40T	S12T Dropping	Resistor	Same as R6T		Ohmite
R41T	S13T Dropping	Resistor	Same as R6T		Ohmite
R42T	Dropping	Resistor	2200 ohms, 2 w., ±10%, composition		Ohmite
R43T	Loading	Resistor	6800 ohms, 2 w., ± 10%, composition		Ohmite
R44T	Loading	Resistor	Same as R43T		Ohmite
R45T	S14T Dropping	Resistor	Same as R6T		Ohmite

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
R46T	S17T Dropping	Resistor	Same as R6T		Ohmite
R47T	Limiting	Resistor	1000 ohm, 2 w., ± 10%, composition		Ohmite
R48T	Failsafe, B/ Loading	Resistor	Same as R17T		Ohmite
R49T	B/ Loading	Resistor	Same as R17T		Ohmite
R50T	B- Loading	Resistor	Same as R17T		Ohmite
R51T	Dropping	Resistor	27 ohms, 1 w., ± 10%, composition		Ohmite
R52T	Dropping	Resistor	Same as R51T		Ohmite
R53T	Dropping	Resistor	Same as R51T		Ohmite
R54T	Dropping	Resistor	Same as R51T		Ohmite
R55T	Limiting	Resistor	Same as R7T		Ohmite
R56T	Arc Suppression	Resistor	Same as R47T		Ohmite
R57T	Arc Suppression	Resistor	Same as R47T		Ohmite
R58T	Arc Suppression	Resistor	Same as R47T		Ohmite
R59T	Arc Suppression	Resistor	Same as R47T		Ohmite
R60T	Dropping	Resistor	Same as R6T		Ohmite

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-T Transmitter Terminal

ELECTRICAL PARTS LIST NO. 30232

REF. DWG. NO. 31101R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
S1T	Positive Line, Tip	Relay	Series B, with 6500 ohms coil, to pull in at 25±2 VDC, & drop out at 20 VDC min., 4PDT contacts, per CEMC Spec. #10850-B	PB 3040-96	Automatic Elec.
S2T	Negative Line, Tip	Relay	Same as S1T		Automatic Elec.
S3T	Positive Line, Ring	Relay	Same as S1T		Automatic Elec.
S4T	Negative Line, Ring	Relay	Same as S1T		Automatic Elec.
S5T	On/Raise	Relay	Same as S1T		Automatic Elec.
S6T	Off/Lower	Relay	Same as S1T		Automatic Elec.

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-T Transmitter Terminal

ELECTRICAL PARTS LIST NO. 30232

REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
S7T	#1 Auxiliary	Relay	7000 ohm coil, 110 VDC, 6 PNO contacts, per CEMC Spec. #10875	3SAA1004	General Elect
S8T	#2 Auxiliary	Relay	8000 ohm coil, 110 VDC, 6 PDT, contacts per CEMC Spec. #10854-B	LS4400-1	Potter-Brumfi
S9T	#3 Auxiliary	Relay	Same as S7T		General Elec.
S10T	#4 Auxiliary	Relay	Same as S7T		General Elec.
S11T	#5 Auxiliary	Relay	Same as S7T		General Elec.
S12T	#6 Auxiliary	Relay	Same as S7T		General Elec.
S13T	#7 Auxiliary	Relay	Same as S7T		General Elec.
S14T	#2A On Aux.	Relay	7000 ohm coil, 4 PDT contacts, per CEMC. Spec. No. 10705-C	CR2791G122AL1	General Elec
S15T	#2A Off	Relay	Same as S14T		General Elec.
S16T	#2A Overload Report	Relay	Same as S14T		General Elec.
S17T	#2B On Aux.	Relay	Same as S14T		General Elec.
S18T	#2B Off	Relay	Same as S14T		General Elec.
S19T	#2B Overload Report	Relay	Same as S14T		General Elec.
S20T	Select A Report	Relay	Same as S14T		General Elec.

Revised 6-7-61
6-21-61

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
S21T	Select	Relay	Series LEL Impulse Latching, lockup coil 5000 ohms, 120 VDC, with 7 PDT load contacts; release coil 6000 ohms, 120 VDC, with SPDT load contact; per CEMC Spec. #10851-B	PB 30422-20	Automatic Elec
S22T	Select A Aux.	Relay	Same as S8T		Potter-Brumfiel
S23T	Select B Aux.	Relay	Same as S8T		Potter-Brumfiel
T1T	Power	Transformer	140-120-0-120-140 volts at 150 ma., 6.3 VCT at 5 amps.	A 8081	ADC
TS1T	Connecting	Terminal Strip		440Y-28	Gen. Pro.
TS2T	Connecting	Terminal Strip		440-27	Gen. Pro.
TS3T	Connecting	Terminal Strip		440-28	Gen. Pro.

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
VS1T	S1T Relay	Socket	20 pin, black bakelite, bottom mount	77M1P20	Amphenol
VS2T	S2T Relay	Socket	Same as VS1T		Amphenol
VS3T	S3T Relay	Socket	Same as VS1T		Amphenol
VS4T	S4T Relay	Socket	Same as VS1T		Amphenol
VS5T	S5T Relay	Socket	Same as VS1T		Amphenol
VS6T	S6T Relay	Socket	Same as VS1T		Amphenol
VS7T	S7T Relay	Socket	14 pin, miniature, MICA,- filled bakelite, bottom mount	699PHSPTD	Elco
VS8T	S8T Relay	Socket	20 pin, miniature, mica-filled bakelite, bottom mount	54A17686	Cinch
VS9T	S9T Relay	Socket	Same as VS7T		Elco
VS10T	S10T Relay	Socket	Same as VS7T		Elco
VS11T	S11T Relay	Socket	Same as VS7T		Elco
VS12T	S12T Relay	Socket	Same as VS7T		Elco
VS13T	S13T Relay	Socket	Same as VS7T		Elco
VS14T	S14T Relay	Socket	Same as VS7T		Elco
VS15T	S15T Relay	Socket	Same as VS7T		Elco
VS16T	S16T Relay	Socket	Same as VS7T		Elco
VS17T	S17T Relay	Socket	Same as VS7T		Elco

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 31101-E ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
VS18T	S18T Relay	Socket	Same as VS7T		Elco
VS19T	S19T Relay	Socket	Same as VS7T		Elco
VS20T	S20T Relay	Socket	Same as VS7T		Elco
VS21.1T	S21T Relay	Socket	12 pin, black bakelite, bottom mount	77M1P12	Amphenol
VS21.2T	S21T Relay	Socket	Same as VS21.1T		Amphenol
VS22T	S22T Relay	Socket	Same as VS8T		Cinch
VS23T	S23T Relay	Socket	Same as VS8T		Cinch
VS24T	C1T Capacitor	Socket	3 pin, black bakelite, bottom mount	2C5	Cinch
VS25T	C2T Capacitor	Socket	Same as VS24T		Cinch
VS26T	C3T Capacitor	Socket	4 pin, black bakelite, bottom mount	2C7	Cinch
X1T	S14T Blocking	Diode	750 MA, 600 P.I.V., silicon	IN2071	T I
X2T	S17T Blocking	Diode	Same as X1T		T I
X3T	S1T Polarizing	Diode	Same as X1T		T I

Revised 8-14-61

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TYPE TRC-3 Transmitter Remote Control System

UNIT TRC-T Transmitter Terminal

ELECTRICAL PARTS LIST NO. 30232

REF. DWG. NO. 31101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
X4T	S2T Polarizing	Diode	Same as X1T		T. I.
X5T	S3T Polarizing	Diode	Same as X1T		T. I.
X6T	S4T Polarizing	Diode	Same as X1T		T. I.
X7T	Metering Line, Polarizing	Diode	Same as X1T		T.I.
X8T	S6T Blocking	Diode	Same as X1T		T. I.
X9T	Metering Line, Polarizing	Diode	Same as X1T		T. I.
X10T	Meter Protection	Diode	Same as X1T		T. I.
X11T	Meter Protection	Diode	Same as X1T		T. I.
X12T	S5T Biasing	Diode	27 volt zener	IN971-A	Motorola
X13T	S5T Biasing	Diode	Same as X12T		Motorola
X14T	S6T Biasing	Diode	Same as X12T		Motorola
X15T	S6T Biasing	Diode	Same as X12T		Motorola
X16T	S7T Polarizing	Diode	Same as X1T		T. I.
X17T	S8T Polarizing	Diode	Same as X1T		T. I.
X18T	S9T Polarizing	Diode	Same as X1T		T. I.
X19T	S10T Polarizing	Diode	Same as X1T		T. I.
X20T	S11T Polarizing	Diode	Same as X1T		T. I.

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TYPE TRC-3 Transmitter Remote Control System | ELECTRICAL PARTS LIST NO. 30232

UNIT TRC-T Transmitter Terminal | REF. DWG. NO. 21101-R ENGR. RPB

SYMBOL	FUNCTION	NAME OF PART	DESCRIPTION	PART NO.	MANUFACTURER
X21T	S21T Polarizing	Diode	Same as X1T		T. I.
X22T	Failsafe B/ Blocking	Diode	Same as X1T		T. I.
X23T	S21T Blocking	Diode	Same as X1T		T. I.
X24T	Positive Power Supply	Diode	Same as X1T		T. I.
X25T	Negative Power Supply	Diode	Same as X1T		T. I.
X26T	S21T Blocking	Diode	Same as X1T		T. I.
X27T	Failsafe B/ Blocking	Diode	Same as X1T		T. I.
X28T	Local Alarm Blocking	Diode	Same as X1T		T. I.
X29T	#2A On Report	Diode	Same as X1T		T. I.
X30T	#2B On Report	Diode	Same as X1T		T. I.
Y1T	Calibrate	Battery	4.05 volt Mercury Cell	TR 133 R	Mallory
YS1T	Calibrate Battery	Holder	For single TR 133R Mallory Cell	44	Acme Model Eng
Z1T,	Lamp & Filter	Tool		15 PA 32	Microswitch

Date Sept. 7, 1961

INTRA-UNIT WIRING LIST UNIT- S

File # 35035

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Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 30233 Assembly# D-31104 FO-

Note: All wire is #22, Belden Type 8513

Wire #	Size	From	To	Route
1.	Wht/Red	TS1-1	D9-7	
2.	Yel	TS1-2	D10-7	
3.	Wht/Org	TS1-3	S1-2	
4.	Blu	TS1-4	S2-2	
5.	Blk	TS1-5	Gnd	(at C2 socket)
6.	Blk	TS1-6	TS1-5	
7.	Vio	TS1-7	M1(/)	
8.	Wht/Blu	TS1-8	TP1	
9.	Wht/Red	TS1-9	TP2	
10.	Brn	TS1-10	S3-4	
11.	Blu	TS1-11	S4-6	
12.	Yel	TS1-12	D5-1	
13.	Grn	TS1-13	D3-3	
14.	Wht/Org	TS1-14	D4-3	
15.	Wht/Blk/Grn	TS1-15	D5-3	
16.	Gry	TS1-16	S1-1	
17.	Blk	TS1-17	TS1-6	
18.	Wht/Blk	TS1-18	S2-1	
19.	Org	TS1-19	C2-(-)	
20.	Org	TS1-19	TS1-23	
21.	Blk	TS1-20	TS1-17	
22.	Vio	TS1-21	T1-3	
23.	Red	TS1-22	C1.1(/)	
24.	Brn	TS1-24	S5-10	
25.	Yel	TS1-26	S6-10	
26.	Blk	T1-5	Gnd	(at C2 socket)
27.	Blk	T1-8	Gnd	(at C2 socket)
28.	Wht	S1-1	D8-1	
29.	Red	S1-5	C1.1(/)	
30.	Yel	S1-6	TP15	
31.	Vio	S2-1	D8-4	
32.	Red	S2-5	S1-5	
33.	Grn	S2-6	TP16	
34.	Blu	S3-6	S8-5	
35.	Wht/Grn	S3-7	S7-5	
36.	Grn	S3-5	E7A-2	
37.	Brn	S3-11	S4-2	
38.	Org.	S3-14	C2-(-)	

Note: Special color assignments are: Black - Ground
Red - B/
Orange - B-

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INTRA-UNIT WIRING LIST UNIT- S

File # 35035

Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 30233 Assembly# D31104 FO-

Wire #	Size	From	To	Route
39.	Yel	S3-8	TP9	
40.	Wht/Red	S4-4	TP7	
41.	Grn	S4-5	TP8	
42.	Gry	S4-7	E7C-2	
43.	Wht/Brn	S4-12	D2-9	
44.	Red	S4-14	C1.1(/)	
45.	Red	S4-14	D9-3	
46.	Yel	S4-11	S3-2	
47.	Vio	S5-11	TP15	
48.	Blu	S5-13	E2A-2	
49.	Wht/Red/Org	S6-11	TP16	
50.	Wht/Grn	S6-13	E2D-2	
51.	Brn	S7-1	TP13	
52.	Gry	S7-4	E6A-2	
53.	Yel	S8-1	TP13	
54.	Wht/Red	S8-4	E6D-2	
55.	Brn	D1-1	D2-2	
56.	Wht/Red	D1-2	D10-8	
57.	Grn	D1-3	D8-6	
58.	Blu	D1-4	D2-5	
59.	Yel	D1-5	X14(/)	
60.	Gry	D1-6	D3-6	
61.	Wht	D1-7	D2-8	
62.	Wht/Blk	D8-2	D7-4	
63.	Brn	D8-3	D5-6	
64.	Yel	D8-5	D7-7	
65.	Wht/Org	D8-6	D2-3	
66.	Wht/Blk	D2-1	D10-9	
67.	Brn	D2-3	D4-9	
68.	Yel	D2-4	D3-5	
69	Grn	D2-6	D5-6	
70.	Blu	D2-6	D9-4	
71.	Vio	D2-7	D3-8	

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INTRA-UNIT WIRING LIST UNIT- S

File #35035

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Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 30233 Assembly# D-31104 FO-

Wire #	Size	From	To	Route
72.	Wht	D3-4	D4-5	
73.	Vio	D3-6	D4-6	
74.	Brn	D3-7	D4-8	
75.	Wht/Brn	D3-9	D5-9	
76.	Blu	D4-4	D5-5	
77.	Grn	D4-6	D6-3	
78.	Vio	D4-7	D5-8	
79.	Wht/Red	D4-9	D6-9	
80.	Wht	D5-4	D6-5	
81.	Wht/Blk	D5-7	D6-8	
82.	Wht/Yel	D5-9	D7-9	
83.	Wht/Vio	D6-1	D7-2	
84.	Yel	D6-2	D9-8	
85.	Blu	D6-3	D7-3	
86.	Vio	D6-4	D7-5	
87.	Wht/Blu	D6-7	D7-8	
88.	Wht/Org	D6-9	D10-4	
88-1/2	Gry	D6-6	TP14	
89.	Brn	D7-1	D9-9	
90.	Wht/Brn	D7-3	D9-1	
91.	Grn	D7-9	D10-1	
92.	Vio	D9-2	D1-8	
93.	Wht/Yel	D9-2	D10-2	
94.	Red	D9-3	D10-3	
95.	Wht/Blu	D9-5	X15(-)	
96.	Gry	D9-5	D10-5	
97.	Org	D9-6	C2(-)	
98.	Org	D9-6	D10-6	
99.	Grn	D9-8	R16-2	
100.	Brn	D10-4	D1-3	
101.	Wht	D10-8	TP4	
102.	Brn	J1-1	F1-1	
103.	Gry	J1-2	T1-2	
104.	Wht/Red/Yel	F1-2	D11-1	
105.	Vio	T1-1	D11-3	

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INTRA-UNIT WIRING LIST UNIT-S

File #35035

Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 3-233 Assembly# D-31104 FO-

Wire #	Size	From	To	Route
106.	Vio	R16-2	TP6	
107.	Brn	E11A-1	TP10	
108.	Yel	E11A-1	E8A-1	
109.	Blk	E8A-2	Gnd	(at C2 socket)
110.	Wht/Blk/Grn	E1A-1	R14-2	
111.	Wht	E1A-1	E2A-1	
112.	Wht/Blk	E2A-1	E3A-1	
113.	Brn	E3A-1	E4A-1	
114.	Yel	E4A-1	E5A-1	
115.	Grn	E5A-1	E6A-1	
116.	Blu	E6A-1	E7A-1	
117.	Vio	E7A-1	E9A-1	
118.	Gry	E9A-1	E10A-1	
119.	Wht	E7A-2	E6B-2	
120.	Wht/Blk	E6B-2	E5A-2	
121.	Grn	E5A-2	E4A-2	
122.	Wht/Org	E4A-2	E3A-2	
123.	Wht/Red	E3A-2	E2B-2	
124.	Gry	E2B-2	E1A-2	
125.	Wht	E1A-2	E9A-2	
126.	Brn	E9A-2	E10A-2	
126.1	Blk	E8C-2	E11A-2	
127.	Yel	E7C-2	E6C-2	
128.	Wht/Grn	E6C-2	E5C-2	
129.	Blu	E5C-2	E4C-2	
130.	Vio	E4C-2	E3C-2	
131.	Gry	E3C-2	E2C-2	
132.	Wht	E2C-2	E1C-2	
133.	Wht/Blk	E1C-2	E9B-2	
134.	Yel	E9B-2	E10B-2	
135.	Grn	M1-(-)	TP2	
135.1	Wht/Org	T1-3	R14-1	
136.	Brn	R16-1	TP1	
137.	Yel	TP11	X15(-)	
138.	Blk	TS1-25	TS1-20	
139.	Blu	M1(+)	D3-2	
140.	Wht/Grn	D3-1	D4-2	
141.	Gry	D4-1	D5-2	

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INTRA-UNIT WIRING LIST

UNIT-S

File #35035

Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 30233 Assembly# D-31104 FO-

Wire #	Size	From	To	Route
	The following connections are not in cable form:			
142.	Blk	S3-3	Gnd	(at S3 Socket)
143.	Blk	S3-3	S3-12	
144.	Blk	S3-12	S3-13	
145.	Blk	S4-3	Gnd	(at S4 Socket)
146.	Blk	S4-3	S4-13	
147.	Blk	S5-2	Gnd	(at S5 Socket)
148.	Blk	S5-2	S5-3	
149.	Blk	S5-3	S5-6	
150.	Blk	S6-2	Gnd	(at S6 Socket)
151.	Blk	S6-2	S6-3	
152.	Blk	S6-3	S6-6	
153.	Blk	S7-7	Gnd	(at S5 Socket)
154.	Yel	D1-5	D1-8	
155.	Blk	S8-7	Gnd	(at S6 Socket)
156.	Blu	S6-5	S6-4	
157.	Wht	S5-5	S5-4	
158.	Grn	TP12	X14(+)	
	The following are component leads:			
		S4-11	X6-(-)	
		X6(+)	TP3	
		S3-1	R18-1	
		R18-2	S4-8	
		S4-2	X8(-)	
		X8(+)	TP5	
		X7(+)	TP5	
		X7(-)	TP4	
		S4-9	R17-1	
		R17-2	Gnd	(at S4 Socket)
		S4-1	R4-1	
		R4-2	TP9	
		X10(+)	S5-1	
		X10(-)	TP7	
		R7-1	S5-1	
		R7-2	S5-9	
		S5-12	X11(-)	

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INTRA-UNIT WIRING LIST UNIT- S

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Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic # 31100-E EPL # 30233 Assembly# D-31104 FO-

Wire #	Size	From	To	Route
		X11(+)	TP7	
		S6-1	X12(+)	
		X12(-)	TP8	
		X13(+)	TP8	
		X13(-)	S6 12	
		R6-1	S6-1	
		R6-2	S6-9	
		X9 (-)	TP6	
		X9 (+)	TP3	
		R16-2	R16-3	Bus
		T1-7	R1-1	
		R1-2	TP	(at C1 Socket)
		X1(-)	TP	(at C1 Socket)
		X1(+)	C1.1(+)	
		T1-9	R2-1	
		R2-2	TP	(at C2 Socket)
		X2(+)	TP	(at C2 Socket)
		X2(-)	C2(-)	
		C1(-)	Gnd	(at C1 Socket)
		C2(+)	Gnd	(at C2 socket)
		S3-9	R3-1	
		R3-2	Gnd	(at S3 Socket)
		R15-1	M1-(-)	
		R15-2	M1-(+)	
		X3(+)	TP2	
		X3(-)	TP1	
		X4(-)	TP2	
		X4(+)	TP1	
		X5(-)	TP2	
		X5(+)	TP4	
		R13-1	R14-1	
		R13-2	TP10	
		R9-1	TP13	
		R9-2	TP14	
		C3-1	TP13	
		C3-2	Gnd	Gnd Lug at TP14

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INTRA-UNIT WIRING LIST UNIT- S

File # 35035

Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial # 313 and above

Schematic # 31100-E EPL # 30233 Assembly# D-31104 FO-

Wire #	Size	From	To	Route
		R26-1	TP15	
		R26-2	C1.2/	
		R24-1	S1-1	
		R24-2	S1-2	
		R25-1	S2-1	
		R25-2	S2-2	
		R20-1	C1.1(/)	
		R20-2	TP12	
		R21-1	TP12	
		R21-2	Gnd	(At C1 Socket)
		R22-1	TP11	
		R22-2	Gnd	(At Transformer)
		R23-1	TP11	
		R23-2	C2(-)	
		R27-1	TP16	
		R27-2	C1.3(/)	
		#22 gauge bus with yellow sleeving.		
		E1A-1	E1B-1	
		E1B-1	E1C-1	
		E1C-1	E1D-1	
		E2A-1	E2B-1	
		E2B-1	E2C-1	
		E2C-1	E2D-1	
		E3A-1	E3B-1	
		E3B-1	E3C-1	
		E3C-1	E3D-1	
		E4A-1	E4B-1	
		E4B-1	E4C-1	
		E4C-1	E4D-1	
		E5A-1	E5B-1	
		E5B-1	E5C-1	
		E5C-1	E5D-1	
		E6A-1	E6B-1	
		E6B-1	E6C-1	
		E6C-1	E6D-1	
		E7A-1	E7B-1	
		E7B-1	E7C-1	
		E7C-1	E7D-1	
		E8A-1	E8C-1	

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INTRA-UNIT WIRING LIST

UNIT- S

Title: Type TRC-S Studio Terminal
TRC-3 Transmitter Remote Control
Serial #313 and above

Schematic No. 31100-E EPL No. 30233 Assembly No. D-31104 Job No.

Wire No.	Size	From	To	Route
		E9A-1	E9B-1	
		E9B-1	E9C-1	
		E9C-1	E9D-1	
		E10A-1	E10B-1	
		E10B-1	E10C-1	
		E10C-1	E10D-1	
		E11A-1	E11C-1	
		#22 gauge bus, black sleeving		
		E1A-2	E1B-2	
		E1C-2	E1D-2	
		E3A-2	E3B-2	
		E3C-2	E3D-2	
		E4A-2	E4B-2	
		E4C-2	E4D-2	
		E5A-2	E5B-2	
		E5C-2	E5D-2	
		E7A-2	E7B-2	
		E7C-2	E7D-2	
		E8A-2	E8C-2	
		E9A-2	E9C-2	
		E9B-2	E9D-2	
		E10A-2	E10C-2	
		E10B-2	E10D-2	
		E11A-2	E11C-2	
		External connections on TS1		
	Grn	TS1-7	TS1-8	(loop)
		R19-1	TS1-19	
		R19-2	TS1-20	
		R5-1	TS1-26	
		R5-2	TS1-25	
		R8-1	TS1-24	
		R8-2	TS1-25	
		R11-1	TS1-16	
		R11-2	TS1-17	
		R12-1	TS1-18	
		R12-2	TS1-17	

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INTRA-UNIT WIRING LIST UNIT- T

File # 35034

Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ~~EO-~~

Note: All wire is #22, Belden Type 8513

Wire #	Size	From	To	Route
1	Bwn	TS1-1	R1-1	
2	Yel	TS1-2	R2-1	
3	Grn	TS1-3	R3-1	
4	Blu	TS1-4	R4-1	
5	Blk	TS1-5	Gnd	(at C2 Socket)
6	Blk	TS1-6	TS1-5	
7	Vio	TS1-7	R21-1	
8	Gry	TS1-8	R22-1	
9	Wht	TS1-9	R23-1	
10	Wht/Blk	TS1-10	R24-1	
11	Bwn	TS1-11	R25-1	
12	Yel	TS1-12	R26-1	
13	Grn	TS1-13	R28-1	
14	Blu	TS1-14	R29-1	
15	Vio	TS1-15	R30-1	
16	Gry	TS1-16	R31-1	
17	Wht	TS1-17	R32-1	
18	Wht/Blk	TS1-18	R33-1	
19	Bwn	TS1-19	R34-1	
20	Yel	TS1-20	S14-2	
21	Blu	TS1-21	S14-10	
22	Vio	TS1-22	S14-8	
23	Gry	TS1-23	TP-18	
24	Wht	TS1-24	S17-2	
25	Wht/Blk	TS1-25	S17-10	
26	Bwn	TS1-26	S17-8	
27	Yel	TS1-27	TP20	
28	Grn	TS2-1	TP1	(at S3-9)
29	Blk	TS2-2	Gnd	(at C2 socket)
30	Vio	TS2-3	D11-5	
31	Gry	TS2-4	TP2	
32	Wht	TS2-5	S16-12	
33	Wht/Blk	TS2-6	S1-6	
34	Bwn	TS2-7	TP22	
35	Yel	TS2-8	TP24	
36	Red	TS2-9	C1-(+)	
37	Org	TS2-11	C2(-)	
38	Grn	TS2-12	S1-16	
39	Blu	TS2-13	S18-7	
40	Vio	TS2-14	S18-1	
41	Gry	TS2-16	T1-3	

Note: Special Color Assignments are: Black - Ground
Red - B+

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INTRA-UNIT WIRING LIST UNIT- T File # 35034

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 KX-

Wire #	Size	From	To	Route
42	Wht	TS2-17	S7-2	
43	Wht/Blk	TS2-18	S8-11	
44	Bwn	TS2-19	S9-2	
45	Yel	TS2-20	S10-2	
46	Grn	TS2-21	S11-2	
47	Blu	TS2-22	S12-2	
48	Vio	TS2-23	S13-2	
49	Gry	TS2-24	S21-1	
50	Wht	TS2-25	D11-3	
51	Blk	TS2-10	Gnd	(at C2 socket)
52	Blk	TS2-10	TS2-15	
53	Bwn	TS3-1	F2-1	
54	Blk	TS3-2	Gnd	(at C1 socket)
55	Yel	TS3-3	S22-13	
56	Grn	TS3-4	S22-15	
57	Blu	TS3-5	S22-12	
58	Vio	TS3-6	S22-14	
59	Gry	TS3-7	S14-5	
60	Wht	TS3-8	S17-5	
61	Wht/Blk	TS3-9	S22-4	
62	Bwn	TS3-10	S22-5	
63	Yel	TS3-11	S22-2	
64	Grn	TS3-12	S22-16	
65	Blu	TS3-13	S22-7	
66	Vio	TS3-14	S22-18	
67	Gry	TS3-15	S22-8	
68	Wht	TS3-16	S22-19	
69	Wht/Blk	TS3-17	S23-12	
70	Bwn	TS3-18	S23-14	
71	Yel	TS3-19	S23-13	
72	Grn	TS3-20	S23-15	
73	Blu	TS3-21	S23-2	
74	Vio	TS3-22	S23-16	
75	Gry	TS3-23	S23-4	
76	Wht	TS3-24	S23-5	
77	Wht/Blk	TS3-25	S23-8	
78	Bwn	TS3-26	S23-19	
79	Yel	TS3-27	S23-7	
80	Grn	TS3-28	S23-18	
81	Blu	S22-20	S7-6	

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INTRA-UNIT WIRING LIST UNIT- T

File # 35034

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ECO# _____

Wire #	Size	From	To	Route
82	Vio	S22-1	S7-9	
83	Gry	S22-3	S9-6	
84	Wht	S22-6	S9-9	
85	Wht/Blk	S22-17	S10-6	
86	Bwn	S22-9	S10-9	
87	Yel	S23-20	S11-6	
88	Grn	S23-1	S11-9	
89	Blu	S23-3	S12-6	
90	Vio	S23-6	S12-9	
91	Gry	S23-17	S13-6	
92	Wht	S23-9	S13-9	
93	Wht/Blk	S22-10	S21-3	
94	Bwn	S23-10	S21-1	
95	Yel	R21-2	S7-4	
96	Grn	R22-2	S7-5	
97	Blu	R23-2	S8-15	
98	Vio	R24-2	S8-4	
99	Gry	R25-2	S9-4	
100	Wht	R26-2	S9-5	
101	Wht/Blk	R28-2	S10-5	
102	Bwn	R29-2	S11-4	
103	Yel	R30-2	S11-5	
104	Grn	R31-2	S12-4	
105	Blu	R32-2	S12-5	
106	Vio	R33-2	S13-4	
107	Gry	R34-2	S13-5	
108	Wht	TP35	S1-20	
109	Wht/Blk	S21-4	E7D-1	
110	Bwn	S21-5	D11-12	
111	Yel	S21-6	E7A-1	
112	Grn	S21-7	S17-8	
113	Blu	S21-8	S5-20	
114	Vio	S21-9	S14-8	
115	Gry	S21-10	S7-13	
116	Wht	S21-11	M1(-)	
117	Wht/Blk	S21-12	S7-12	
118	Bwn	S21-14	S18-3	
119	Yel	S21-16	S15-3	

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INTRA-UNIT WIRING LIST UNIT- T File # 35034

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Title: Type TRC-T Transmitter

Terminal Remote Control

Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 XX

Wire #	Size	From	To	Route
120	Grn	S21-17	E7C-2	
121	Blu	S21-18	E7B-2	
122	Gry	S21-19	TP4	(At S3-14)
123	Wht	S21-20	R2-3	
124	Wht/Blk	S21-21	TP5	
125	Bwn	S21-24	TP6	(At S4-13)
126	Grn	S1-5	S2-4	
127	Blu	S1-3	S2-15	
128	Vio	S1-8	S20-9	
129	Gry	S1-7	S2-8	
130	Wht	S1-6	S2-6	
131	Wht/Blk	S1-15	S2-17	
132	Bwn	S1-16	D7-2	
133	Red	S1-19	S2-19	
134	Yel	C3.3/	TP17	(At S1-13)
135	Wht	S1-4	S15-7	
136	Blu	S2-5	S3-4	
137	Vio	S2-7	TP7	(At S5-13)
138	Gry	S2-16	S3-16	
139	Red	S2-19	S3-19	
140	Wht	S2-20	S1-20	
141	Wht/Blk	S2-20	S3-20	
142	Yel	S3-5	S4-4	
143	Grn	S3-3	S13-2	
144	Blu	S3-7	S4-8	
145	Vio	S3-6	S4-6	
146	Gry	S3-15	S4-16	
147	Wht	S11-2	TP8	(At S3-13)
148	Red	S3-19	S4-19	
149	Wht/Blk	S3-20	S4-20	
150	Yel	S4-3	S12-2	
151	Grn	S4-7	TP9	(At S6-13)
152	Blu	S4-6	S8-8	
153	Vio	S4-15	TP10	
154	Gry	S5-4	S6-5	
155	Wht	S5-3	D9-5	
156	Wht/Blk	S5-8	D10-8	

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Title: Type TRC-T Transmitter

Terminal Remote Control

Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 REV

Wire #	Size	From	To	Route
157	Bwn	S5-7	S6-3	
158	Yel	S5-15	S6-16	
159	Grn	S5-17	S6-7	
160	Blu	S5-19	S6-18	
161	Vio	S5-20	D9-3	
162	Gry	S6-4	D11-2	
163	Wht	S6-8	E9A-2	
164	Wht/Blk	S6-17	E10A-2	
165	Bwn	S6-19	D11-8	
166	Yel	S6-20	S18-2	
167	Grn	S7-1	E1B-1	
168	Blu	S7-2	D1-6	
169	Vio	S7-7	S9-7	
170	Gry	S7-8	S9-8	
171	Wht	S7-10	E1C-1	
172	Wht/Blk	S7-11	S8-20	
173	Bwn	S7-12	S8-1	
174	Yel	S7-13	S8-3	
175	Grn	S8-11	D2-3	
176	Blu	S8-13	E2B-1	
177	Vio	S8-6	S9-14	
178	Gry	S8-1	S9-12	
179	Wht	S8-3	S9-13	
180	Wht/Blk	S8-5	E2C-1	
181	Bwn	S8-7	S15-13	
182	Yel	S8-17	S19-12	
183	Blu	S8-18	D11-7	
184	Red	S8-9	S4-19	
185	Vio	S9-1	E3B-1	
186	Gry	S9-2	D3-6	
187	Wht	S9-7	S10-7	
188	Wht/Blk	S9-8	S10-8	
189	Bwn	S9-10	E3C-1	
190	Yel	S9-11	S10-14	
191	Grn	S9-12	S10-12	
192	Blu	S9-13	S10-13	
192.1	Wht	S9-2	TP29	
193	Gry	S10-1	E4B-1	

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Title: Type TRC-T Transmitter

Terminal Remote Control

Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ~~EC~~ 1

Wire #	Size	From	To	Route
194	Wht	S10-2	D4-6	
195	Wht/Blk	S10-4	Y1-(/)	
196	Bwn	S10-7	S11-7	
197	Yel	S10-8	S11-8	
198	Grn	S10-10	E4C-1	
199	Blu	S10-11	S11-14	
200	Vio	S10-12	S11-12	
201	Gry	S10-13	S11-13	
201.1	Yel	S10-2	TP11	(S4-9)
202	Wht	S11-1	E5B-1	
203	Wht/Blk	S11-2	D5-3	
204	Bwn	S11-7	S12-7	
205	Yel	S11-8	S12-8	
206	Grn	S11-10	E5C-1	
207	Blu	S11-11	S12-14	
208	Vio	S11-12	S12-12	
209	Gry	S11-13	S12-13	
210	Wht	S12-1	E6B-1	
211	Wht/Blk	S12-2	D6-6	
212	Bwn	S12-7	S13-7	
213	Yel	S12-8	S13-8	
214	Grn	S12-10	E6C-1	
215	Blu	S12-11	S13-14	
216	Vio	S12-12	S13-12	
217	Gry	S12-13	S13-13	
218	Wht	S13-1	E7B-1	
219	Wht/Blk	S13-2	D7-6	
220	Bwn	S13-7	D10-4	
221	Yel	S13-8	D9-7	
222	Grn	S13-10	E7C-1	
223	Blu	S13-11	TP12	
224	Vio	S14-6	S15-12	
225	Gry	S14-7	S17-7	
226	Wht/Blk	S14-12	S17-12	
227	Bwn	S14-13	C3.1(/)	
228	Grn	S15-1	S18-1	
229	Blu	S15-2	S18-2	
230	Vio	S15-4	S16-2	

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ~~EQ~~

Wire #	Size	From	To	Route
231	Gry	S15-6	S18-13	
232	Wht	S15-7	S18-7	
233	Wht/Blk	S15-1	C3.3(/)	
234	Org	S16-10	S19-10	
235	Bwn	S16-11	R3-3	
236	Yel	S17-6	S18-12	
238	Gry	S17-12	F2-2	
239	Wht	S17-13	C3.2(/)	
239.1	Yel	F2-2	TP-44	
240	Wht/Blk	S18-4	S19-2	
241	Org	S19-10	C2(-)	
242	Bwn	S18-6	TP31	
244	Yel	S19-11	R4-3	
245	Grn	S20-9	C3.4(/)	
246	Bwn	S20-14	R1-3	
247	Red	D1-1	C1(/)	
248	Yel	D1-2	D2-1	
249	Org	D1-4	C2(-)	
250	Grn	D1-5	D2-4	
251	Blu	D2-2	D3-1	
252	Vio	D2-5	D3-4	
253	Gry	D3-2	D4-1	
254	Wht	D3-5	D4-4	
255	Wht/Blk	D4-2	D5-1	
256	Bwn	D4-5	D5-4	
257	Yel	D5-2	D6-1	
258	Grn	D5-5	D6-4	
259	Blu	D6-2	D7-1	
260	Vio	D6-5	D7-4	
261	Gry	D7-5	S1-4	
262	Wht	D8-1	TP3	(at S1-9)
263	Wht/Blk	D9-1	D10-2	

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Title: Type TRC-T Transmitter

Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 EC

Wire #	Size	From	To	Route
264	Bwn	D9-4	D10-5	
265	Yel	D9-6	D10-9	
266	Grn	D9-8	D10-7	
267	Blu	D10-1	D11-9	
268	Vio	D10-3	S6-20	
269	Gry	D10-9	D11-3	
270	Wht	D11-1	F2-2	
271	Wht/Blk	D11-4	TP16	
272	Red	D11-6	D1-1	
273	Bwn	D11-10	R20-2	
274	Yel	D11-11	TP41	
275	Grn	D11-12	E11C-1	
276	Blu	E11D-1	E8A-1	
277	Bwn	E11A-1	TP42	
278	Vio	E7B-2	E6B-2	
279	Gry	E6B-2	E5B-2	
280	Wht	E5B-2	E4B-2	
281	Wht/Blk	E4B-2	E3B-2	
282	Bwn	E3B-2	E2B-2	
283	Yel	E2B-2	E1B-2	
284	Grn	E7C-2	E6C-2	
285	Blu	E6C-2	E5C-2	
286	Vio	E5C-2	E4C-2	
287	Gry	E4C-2	E3C-2	
288	Wht	E3C-2	E2C-2	
289	Wht/Blk	E2C-2	E1C-2	
290	Bwn	E7A-1	E6A-1	
291	Yel	E6A-1	E5A-1	
292	Grn	E5A-1	E4A-1	
293	Blu	E4A-1	E3A-1	
294	Vio	E3A-1	E2A-1	
295	Gry	E2A-1	E1A-1	
296	Wht	E7D-1	E6D-1	
297	Wht/Blk	E6D-1	E5D-1	
298	Bwn	E5D-1	E4D-1	

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ~~EQ~~

Wire #	Size	From	To	Route
299	Yel	E4D-1	E3D-1	
300	Grn	E3D-1	E2D-1	
301	Blu	E2D-1	E1D-1	
302	Grn	D11-11	TP40	
303	Vio	E9B-1	E10B-1	
304	Gry	E10B-1	E8A-1	
305	Wht	E9A-1	E10A-1	
306	Wht/Blk	E10A-1	TP30	
307	Blk	E11A-2	E9B-2	
308	Blk	E9B-2	E10B-2	
309	Blk	E10B-2	E7A-2	
310	Blk	E7A-2	E6A-2	
311	Blk	E6A-2	E5A-2	
312	Blk	E5A-2	E4A-2	
313	Blk	E4A-2	E3A-2	
314	Blk	E3A-2	E2A-2	
315	Blk	E2A-2	E1A-2	
316	Blk	E1A-2	E8A-2	
317	Blk	E8A-2	Gnd	(at C1 Socket)
319	Bwn	TP19	TP23	
320	Yel	TP21	TP19	
321	Grn	TP21	TP25	
322	Blu	TP25	T1-3	
323	Red	TP13	TP14	
324	Red	TP14	C1(+)	
325	Red	TP14	S1-19	
328	Gry	M1(-)	TP15	
329	Wht	R27-3	TP26	
330	Org	R18-1	C2(-)	
331	Wht/Blk	J1-1	F1-1	
332	Bwn	F1-2	T1-1	
333	Bwn	J1-2	T1-2	
334	Blk	R18-2	Gnd	(at C2 socket)
335	Blk	Y1(-)	Gnd	(at C1 socket)

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Title: Type TRC-T Transmitter

Terminal Remote Control

. Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 ~~XX~~

Wire #	Size	From	To	Route
336	Blk	R34-3	R32-3	
337	Blk	R32-3	R30-3	
338	Blk	R30-3	R28-3	
339	Blk	R28-3	R26-3	
340	Blk	R26-3	R24-3	
341	Blk	R24-3	R22-3	
342	Blk	R22-3	R21-3	
343	Blk	R21-3	R23-3	
344	Blk	R23-3	R25-3	
345	Blk	R25-3	R29-3	
346	Blk	R29-3	R31-3	
347	Blk	R31-3	R33-3	
348	Blk	R33-3	Gnd	(at C2 socket)
349	Blk	S21-13	S1-2	
350	Blk	S1-2	S2-2	
351	Blk	S2-2	S3-2	
352	Blk	S3-2	S4-2	
353	Blk	S4-2	S5-2	
354	Blk	S5-16	S6-2	
355	Blk	S6-2	Gnd	(at C1 socket)
356	Yel	M1(-)	R27-1	
357	Wht	D8-3	TP6	(at S4-13)
358	Blu	R20-1	T1-3	
	The following are point to point connections using wire loops.			
359	Brn	S7-11	S7-14	
360	Yel	S8-20	S8-6	
361	Grn	S9-11	S9-14	
362	Blu	S10-11	S10-14	
363	Vio	S11-11	S11-14	
364	Gry	S12-11	S12-14	
365	Wht	S13-11	S13-14	
366	Wht/Blk	S16-1	S16-4	
367	Brn	S19-1	S19-4	
368	Blk	S22-11	Gnd	(at S22 socket)
369	Blk	S23-11	Gnd	(at S23 socket)
370	Blk	S5-16	S5-2	
371	Blk	T1-8	Gnd	(at C1 socket)
372	Blk	T1-5	Gnd	(at C1 socket)
373	Blk	S14-3	Gnd	(at S14 socket)

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 E~~C~~

Wire #	Size	From	To	Route
374	Blk	S17-3	Gnd	(at socket S17)
375	Blk	S16-3	Gnd	(at socket S16)
376	Blk	S19-3	Gnd	(at socket S19)
377	Blk	S20-3	Gnd	(at socket S20)
		The following are component leads:		
		S7-3	R35-1	
		R35-2	Gnd	(at S7 socket)
		S8-10	R36-1	
		R36-2	Gnd	(at S8 socket)
		S9-3	R37-1	
		R37-2	Gnd	(at S9 socket)
		S10-3	R38-1	
		R38-2	Gnd	(at S10 socket)
		S11-3	R39-1	
		R39-2	Gnd	(at S11 socket)
		S12-3	R40-1	
		R40-2	Gnd	(at S12 socket)
		S13-3	R41-1	
		R41-2	Gnd	(at S13 socket)
		S21-2	R42-2	
		R42-1	TP35	
		S14-1	R43-1	
		R43-2	Gnd	S14 (at socket)
		S17-1	R44-1	
		R44-2	Gnd	(at S17 socket)
		S14-11	R45-1	
		R45-2	S15-11	
		S17-11	R46-1	
		R46-2	S18-11	
		X29(-)	S14-14	
		X29(/)	TP31	
		X30(-)	S17-14	
		X30(/)	S18-6	
		X1 (/)	S14-10	
		X1 (-)	S14-8	
		X2 (/)	S17-10	
		X2 (-)	S17-8	
		S15-5	R7-1	
		R7-2	Gnd	(at socket S15)
		S18-5	R8-1	
		R8-2	Gnd	(at socket S18)

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101-R EPL # 30232 Assembly# D-31105 FO- _____

Wire #	Size	From	To	Route
		R58-2	TP43	
		R58-1	S11-7	
		R59-2	TP45	
		R59-1	S13-8	
		C24-2	TP45	
		C24-1	TP44	
		C23-2	TP43	
		C23-1	TP44	
		R56-1	Gnd	(at S-14 socket)
		R56-2	TP46	
		R57-1	Gnd	(at S-17 socket)
		R57-2	TP47	
		C21-1	S14-5	
		C21-2	TP46	
		C22-1	S17-5	
		C22-2	TP47	
		R60-1	S19-10	
		R60-2	S20-8	

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 FO- _____

Wire #	Size	From	To	Route
		S16-5	R9-1	
		R9-2	TP13	
		S19-5	R10-1	
		R10-2	TP14	
		X3 (+)	S1-1	
		X3 (-)	S1-6	
		X4 (+)	S2-6	
		X4 (-)	S2-1	
		X5 (+)	S3-1	
		X5 (-)	S3-6	
		X6 (+)	S4-6	
		X6 (-)	S4-1	
		X7 (+)	TP1	(At S3-9)
		X7 (-)	TP4	(At S3-14)
		X8 (+)	TP4	(At S3-14)
		X8 (-)	S3-8	
		X9 (+)	S20-9	
		X9 (-)	TP15	
		X10 (+)	M1 (+)	
		X10 (-)	M1 (-)	
		X11 (+)	M1 (-)	
		X11 (-)	M1 (+)	
		R14-1	TP26	
		R14-2	M1 (+)	
		R6-1	S20-2	
		R6-2	TP5	
		X12 (-)	TP7	(At S5-13)
		X12 (+)	TP27	(At S5-9)
		X13 (+)	TP27	(At S5-9)
		X13 (-)	S5-1	
		X14 (-)	TP9	(At S6-13)
		X14 (+)	TP28	(At S6-9)
		X15 (+)	TP28	(At S6-9)
		X15 (-)	S6-1	
		R47-1	S17-7	
		R47-2	TP-13	
		X16 (-)	S7-2	
		X16 (+)	TP10	
		X17 (-)	TP-10	
		X17 (+)	S8-11	
		X18 (+)	S3-17	

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Title: Type TRC-T Transmitter

Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 FO-

Wire #	Size	From	To	Route
		X18 (-)	TP29	
		X20 (-)	S3-17	
		X20 (+)	TP8	(At S3-13)
		X19 (+)	S4-17	
		X19 (-)	TP11	(At S4-9)
		X21 (-)	S4-17	
		X21 (+)	TP6	(At S4-13)
		X22 (+)	S1-20	
		X22 (-)	TP3	(At S1-9)
		X27 (+)	TP3	(At S1-9)
		X27 (-)	TP16	
		X28 (+)	TP16	
		X28 (-)	TP2	
		X23 (+)	S21-23	
		X23 (-)	S21-22	
		X24 (-)	TP on C1	
		X24 (+)	C1 (+)	
		R15-1	T1-7	
		R15-2	TP on C1	
		X25 (-)	C2 (-)	
		X25 (+)	TP on C2	
		R16-2	TP on C2	
		R16-1	T1-9	
		R17-1	C1 (+)	
		R17-2	Gnd at C1	(At C1 Socket)
		R19-1	T1-3	
		R19-2	TP12	
		R55-1	S2-20	
		R55-2	TP17	(At S1-13)
		R5-1	TP30	
		R5-2	TP40	
		R12-1	TP41	
		R12-2	TP42	
		C8-1	R21-2	
		C8-2	R21-3	
		C9-1	R22-2	
		C9-2	R22-3	
		C10-1	R23-2	
		C10-2	R23-3	
		C11-1	R24-2	
		C11-2	R24-3	
		C12-1	R25-2	

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 FO- _____

Wire #	Size	From	To	Route
		C12-2	R25-3	
		C13-1	R26-2	
		C13-2	R26-3	
		C14-1	R28-2	
		C14-2	R28-3	
		C15-1	R29-2	
		C15-2	R29-3	
		C16-1	R30-2	
		C16-2	R30-3	
		C17-1	R31-2	
		C17-2	R31-3	
		C18-1	R32-2	
		C18-2	R32-3	
		C19-1	R33-2	
		C19-2	R33-3	
		C20-1	R34-2	
		C20-2	R34-3	
		X26 (+)	S21-15	
		X26 (-)	S21-24	
		E12-1	TP36	
		E12-2	TP19	
		E13-1	TP37	
		E13-2	TP21	
		E14-1	TP38	
		E14-2	TP23	
		E15-1	TP39	
		E15-2	TP25	
		R51-1	TP18	
		R51-2	TP36	
		R52-1	TP20	
		R52-2	TP37	
		R53-1	TP22	
		R53-2	TP38	
		R54-1	TP24	
		R54-2	TP39	
		R13-1	R27-2	
		R13-2	R27-3	
	#22 GA Bus with yellow sleeving:			
		R1-1	J2-1	
		R1-3	J3-1	
		R2-1	J4-1	
		R2-3	J5-1	

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Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 FO-

Wire #	Size	From	To	Route
		R3-3	J6-1	
		R4-3	J7-1	
		E8A-1	E8C-1	
		E11C-1	E11D-1	
		E11A-1	E11B-1	
		E9B-1	E9D-1	
		E10B-1	E10D-1	
		E10A-1	E10C-1	
		E9A-1	E9C-1	
	#22 GA Bus with black sleeving:			
		E1A-2	E1D-2	
		E2A-2	E2D-2	
		E3A-2	E3D-2	
		E4A-2	E4D-2	
		E5A-2	E5D-2	
		E6A-2	E6D-2	
		E7A-2	E7D-2	
		E8A-2	E8D-2	
		E11C-2	E11D-2	
		E11A-2	E11B-2	
		E9B-2	E9D-2	
		E10B-2	E10D-2	
		E9A-2	E9C-2	
		E10A-2	E10C-2	
		E11B-2	E11C-2	
	#22 GA Bus Without Sleeving:			
		R1-2	R1-3	
		R2-2	R2-3	
		R3-2	R3-3	
		R4-2	R4-3	
		C1 (-)	Gnd	(at C1 socket)
		C2 (+)	Gnd	(at C2 socket)
		C3 (-)	Gnd	(at C3 socket)
	External connections on TS1			
	GRN	TS1-20	TS1-21	(Loop)
	BLU	TS1-24	TS1-25	(Loop)

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Date _____

INTRA-UNIT WIRING LIST UNIT- T

File # 35034

Page 16

of 16

Title: Type TRC-T Transmitter
Terminal Remote Control
Serial 312 and below

Schematic # 31101R EPL # 30232 Assembly# D-31105 FO- _____

Wire #	Size	From	To	Route
	External Connections on		TS2	
		R11-1	TS2-1	
		R11-2	TS2-2	
		R49-1	TS2-9	
		R49-2	TS2-10	
		R50-2	TS2-10	
		R50-1	TS2-11	
		R48-1	TS2-14	
		R48-2	TS2-15	

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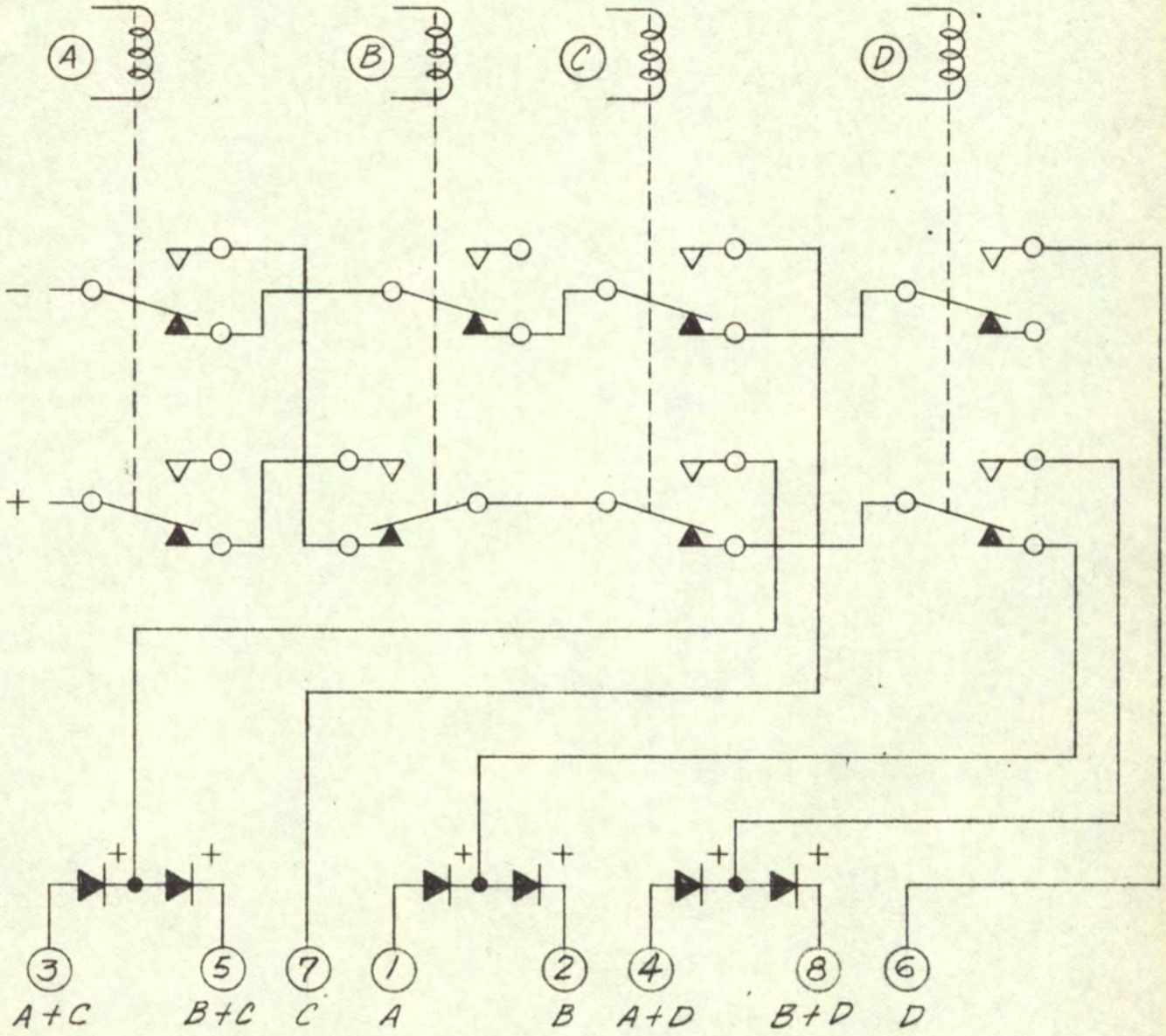
CONTROL RELAYS



VOLTAGE OUTPUTS TO AUXILIARY RELAYS

USED WITH	SYM	REVISIONS	DATE	APP	CONTINENTAL ELECTRONICS MANUFACTURING CO. DALLAS, TEXAS	
MATL ~					SIMPLIFIED SCHEMATIC	
FIN ~					CONTROL RELAY TREE NETWORK TYPE TRC-3 REMOTE CONTROL SYSTEM	
UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°					SCALE: ~	
					APP'D. / ENG. / DRAWN IVEY 7-19-61	31118-A

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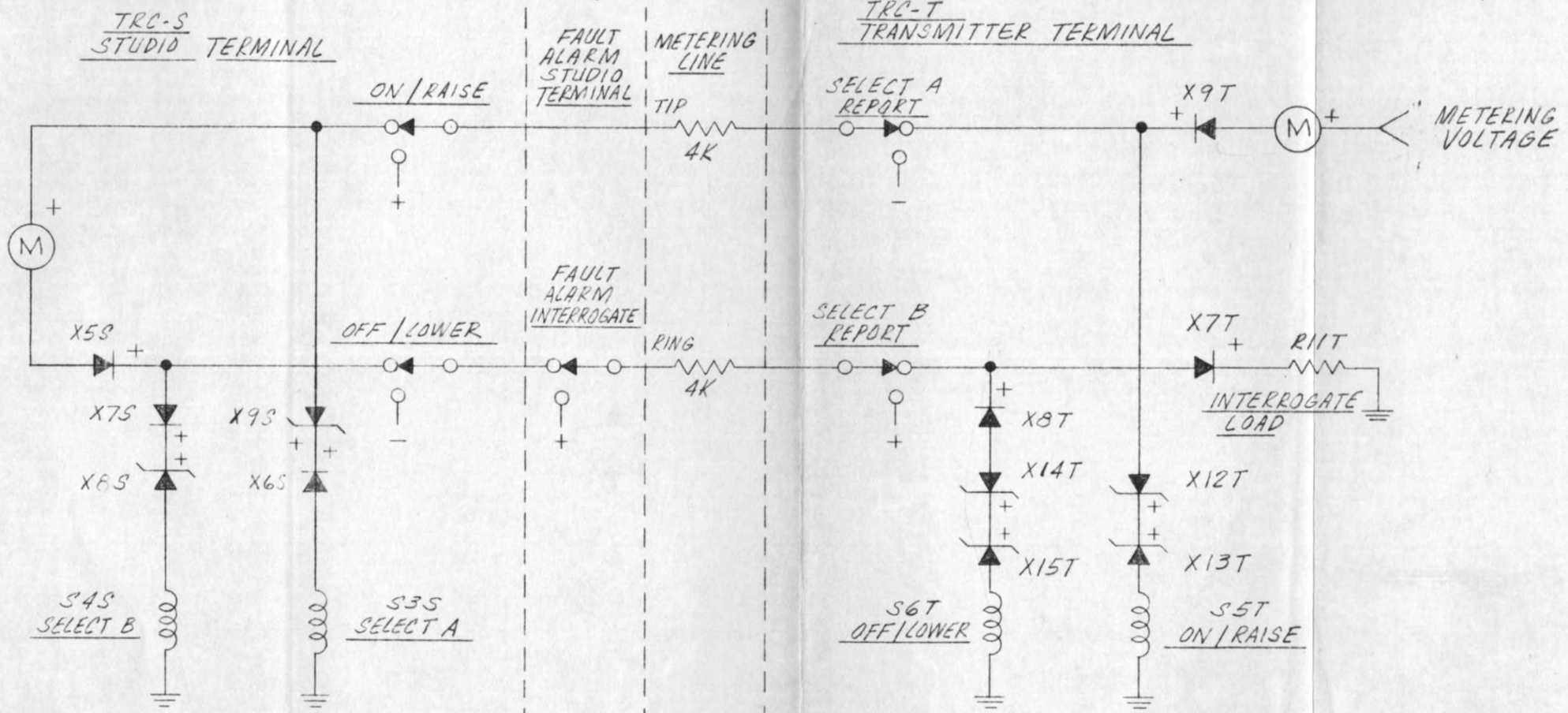

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USED WITH

MATL ~

FIN ~

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
A	ADDED X9S	8-16-61	G.S.

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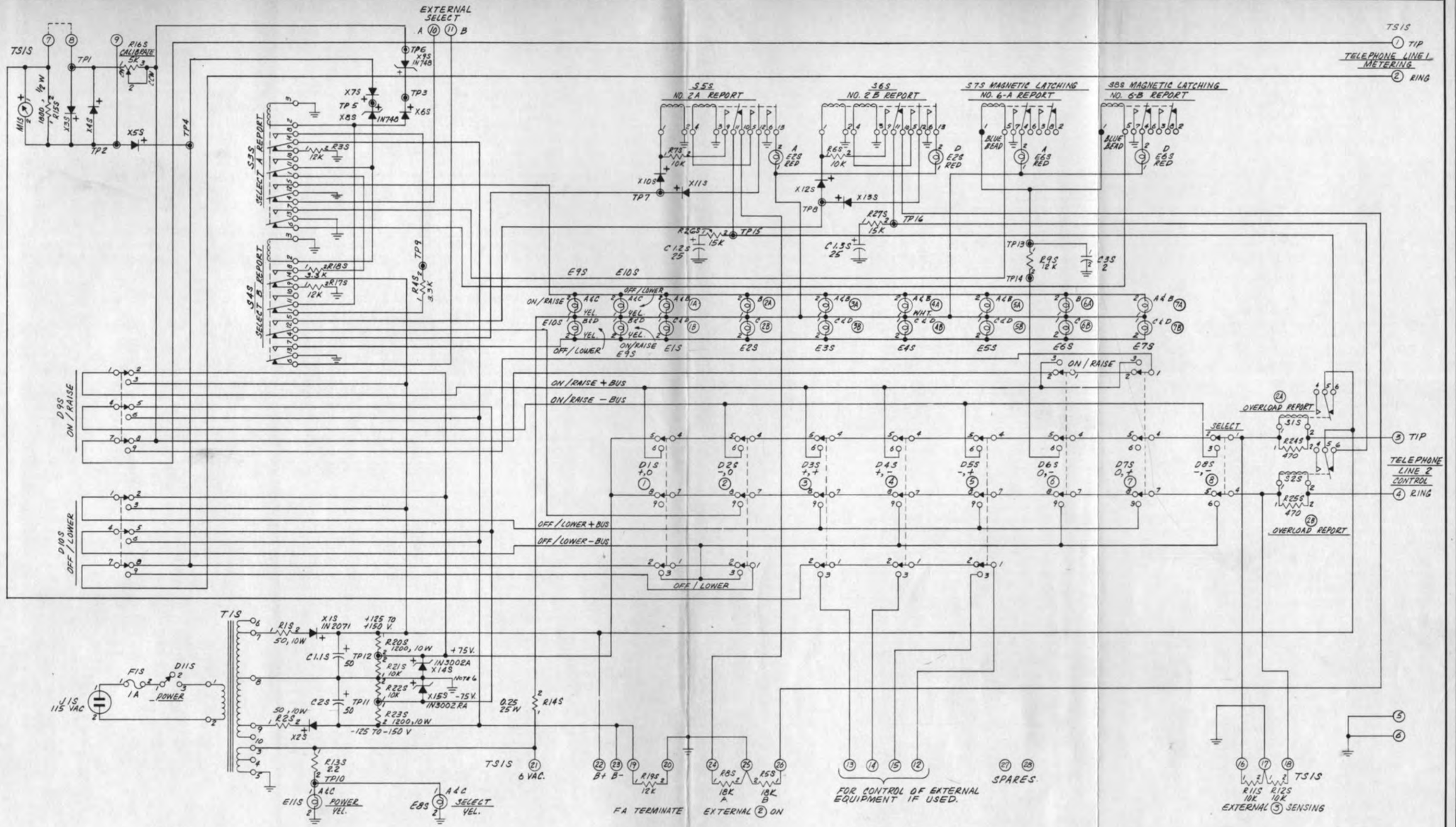
CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SIMPLIFIED SCHEMATIC METERING CIRCUIT TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: ~

APP'D.	ENG.	DRAWN
		IVEY 7-18-61

31119-B



NOTES

1. ALL DIODES ARE IN2071 EXCEPT AS SHOWN.
2. ALL RESISTORS ARE 2 WATT EXCEPT AS SHOWN.
3. FOR RESISTORS, K INDICATES 1000.
4. TP INDICATES COMPONENT TIE POINT.
5. ALL LAMPS FITTED WITH GREEN FILTERS, EXCEPT AS NOTED.
6. X14S & X15S MATCHED TO WITHIN 3 VOLTS, AT 30 MA TEST CURRENT.

NO.	LINE 2 TIP	LINE 2 RING	TYPICAL APPLICATION METERING	TYPICAL APPLICATION SWITCHING
0	0	0	———	FAIL SAFE
1	+	0	FILAMENT VOLT.	FILAMENT ON
2	–	0	PLATE VOLT.	PLATE ON
3	+	+	ANTENNA CURR.	POWER ADJUST
4	+	–	CALIBRATE	TOWER LIGHTS
5	–	+	PLATE CURR.	REDUCED POWER
6	0	–	BASE CURRENT	PATTERN CHANGE
7	0	+	PROGRAM LINE	PROGRAM LINE
8	–	–	———	SELECT

USED WITH EPL-30233, ASSY.-E-31104, WIR. LIST-35035
MAT: N
FIN: N
UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES FRACT. ±1/64 DEC. .015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
G	REDRAWN	1-29-60	IVEY
H	ADDED NOTES, CHG. F1	4-6-60	IVEY
I	MINOR CHANGES	7-6-60	IVEY
J	MINOR CHANGES	7-26-60	LA
K	MINOR CHANGES	8-4-60	GS

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
TYPE TRC-5 STUDIO TERMINAL
TRC-3 TRANSMITTER REMOTE CONTROL

SCALE: N
APP'D. | ENG. | DRAWN IVEY 5-26-60
31100-E

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REDUCE TO 16" (TOLERANCE OF 1/32" INCH)

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INTERROGATE LOAD

REPORT BACK

SELECT 'A' REPORT

PHONE LINE 1 "METERING"

PHONE LINE 2 "CONTROL"

GROUND

2A INTERLOCK

2A RESET

2B RESET

2B INTERLOCK

FAILSAFE B+

AUX OUTPUTS

SELECT B

SIGNAL B+

SIGNAL B-

PILOT

PILOT

B+ 1.6A T 6 V

5A0 2.5A T 5 B-

6 VAC

FAILSAFE B+

SIGNAL "B-"

SIGNAL B+

ON/RAISE BUS

OFF/LOWER BUS

METERING A BUS

METERING B BUS

EXTERNAL LOCAL

LOCAL ALARM

SPARES

LOCK LOCAL LAMPS

METERING

REMOTE LAMPS

REPORT

2 ON

1 OFF

SWITCHING

S2IT, SELECT

A SELECT S22T

B SELECT S23T

METERING INPUTS

SWITCHING OUTPUTS

115 VAC SWITCHING INPUT

SPARE

NOTES

1. ALL DIODES ARE IN2071 EXCEPT AS SHOWN.
2. ALL RESISTORS ARE 2 WATT EXCEPT AS SHOWN.
3. FOR RESISTORS, K INDICATES 1000.
4. SELECT RELAY, S21T, SHOWN IN 'B' SELECT POSITION. NUMBERS REFER TO SOCKET PINS. WIRING WITHIN DOTTED ENCLOSURE IS A PART OF THE RELAY.
5. TP INDICATES COMPONENT TIE POINT. FOR PHYSICAL LOCATION, SEE WIRING LIST.
6. ALL LAMPS ARE FITTED WITH GREEN FILTERS, EXCEPT AS NOTED.
7. ADJUST R3 & R4 FOR 40 VDC AT J6T AND J7T.
8. LOCAL/REMOTE SWITCH, D11T, SHOWN IN REMOTE POSITION.

NO.	LINE 2 TIP	LINE 2 RING	CONTROL RELAYS	TYPICAL APPLICATION METERING	SWITCHING
0	0	0			FAIL SAFE
1	+	0	A	FILAMENT VOLT	FILAMENT ON
2	-	0	B	PLATE VOLT	PLATE ON
3	+	+	A+C	ANTENNA CURR	POWER ADJUST
4	+	-	A+D	CALIBRATE	TOWER LIGHTS
5	-	+	B+C	PLATE CURR.	REDUCED POWER
6	0	-	D	BASE CURRENTS	PATTERN CHANGE
7	0	+	C	PROGRAM LINE	PROGRAM LINE
8	-	-	B+D	———	SELECT

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USED WITH: EPL 30232, ASCH D-3105, WIR LIST 35094

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES FRACT. DEC. ANG. ±1/64 ±.015 ±1°

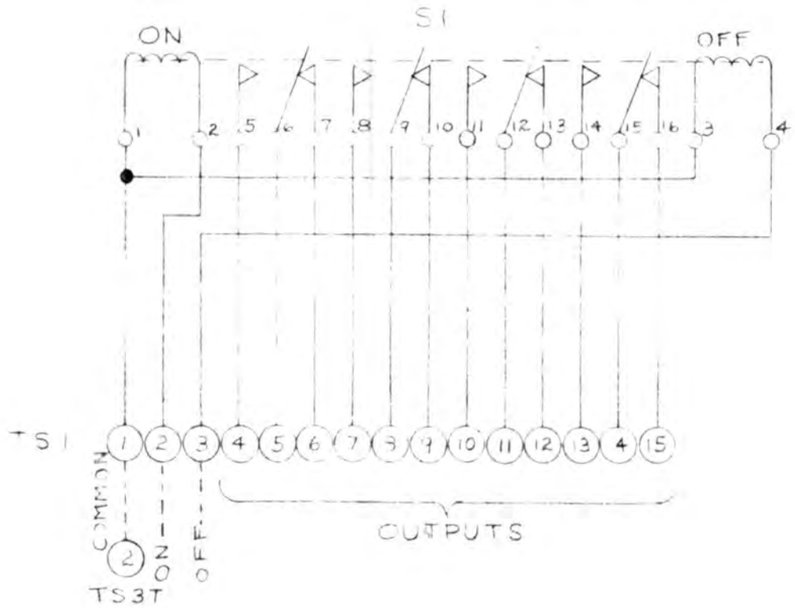
SYM	REVISIONS	DATE	APP
M	REDRAWN	8-23-67	MWT
N	MINOR CHANGE	9-14-67	MWT
O	REVISED TIT TYPES	1-4-68	MWT
P	MINOR CHANGES	2-14-68	MWT
Q	MINOR CHANGES	12-4-68	MWT
R	MINOR CHANGE	8-14-69	MWT
S	ADDED C4T	11-26-69	MWT

CONTINENTAL ELECTRONICS MANUFACTURING CO. DALLAS, TEXAS

SCHEMATIC, TYPE TRT-1, TRANSMITTER TELEMETRY TRC-3 TRANSMITTER REMOTE CONTROL

SCALE: ~ | APP'D | DWN. | DATE 7-7-67 | 31101-R

REDUCE TO 21" (TOLERANCE ±1/8")



NOTES:
1. COIL WIRE CONNECTIONS — #22 GA. WIRE.
2. CONTACT WIRING - #16 GA WIRE.
3. RELAY SHOWN IN OFF POSITION.
4. CONTACT RATING, 10 AMPS. AT 115 VAC NON-INDUCTIVE LOAD.
5. CONNECT TS1-2 AND -3 AT DESIRED SWITCH OUTPUT TERMINALS ON TS3T, TRC T UNIT.

ITEM	PART NO.	MANUFAC.	DESCRIPTION
3	51	POTTER-BRUMFIELD	RELAY - 4PDT, MECHANICAL LATCHING, WITH 10A. CONTACTS, # KB17AG
2	31120-B	C.E.M.C	CHASSIS
1	TS	GEN. PRO.	TERMINAL STRIP #440-15

USED WITH 31101-R, 31120-B

MATL —

FIN —

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
MECHANICAL LATCHING AUX. RELAY UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: —

APP'D	ENG.	DRAWN
		M.T. 7-15-61

31121-B

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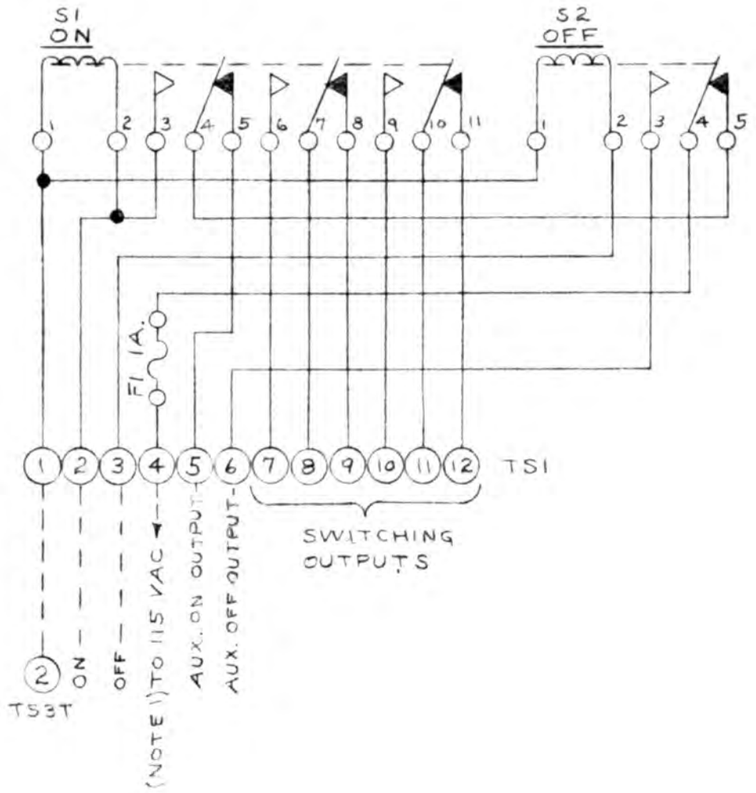

NOTES:

1. 115 VAC HOLDING VOLTAGE SHOULD BE OBTAINED FROM SAME SOURCE THAT FEEDS TS3T-1. OBSERVE CORRECT POLARITY!
2. COIL WIRE CONNECTIONS – #22 GA. WIRE.
3. CONTACT WIRING - #16 GA. WIRE.
4. CONTACT RATING, 10 AMPS. AT 115 VAC NON-INDUCTIVE LOAD.
5. CONNECT TS1-2 AND -3 AT DESIRED SWITCH OUTPUT TERMINALS ON TS3T, TRC-T UNIT.

ITEM	PART NO.	MANUFAC.	DESCRIPTION
5	TS1	GEN. PRO.	TERM. BOARD #440-15
4	S2	OHMITE	RELAY #DOSX-7T, DPDT, 115 VAC COIL
3	S1	OHMITE	RELAY #DOX-46T, 3PDT, 115 VAC COIL
2	F1	LITTELFUSE	#357001 FUSEHOLDER w/ 1 AMP 3AG FUSE
1	31120-B	CEMC	CHASSIS

USED WITH
31101-R
31120-B

MATL _____

FIN _____

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
ELECTRICAL LATCH AUX. RELAY UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: _____

APP'D.	ENG.	DRAWN
		M.L.T. 7-21-61

31122-B

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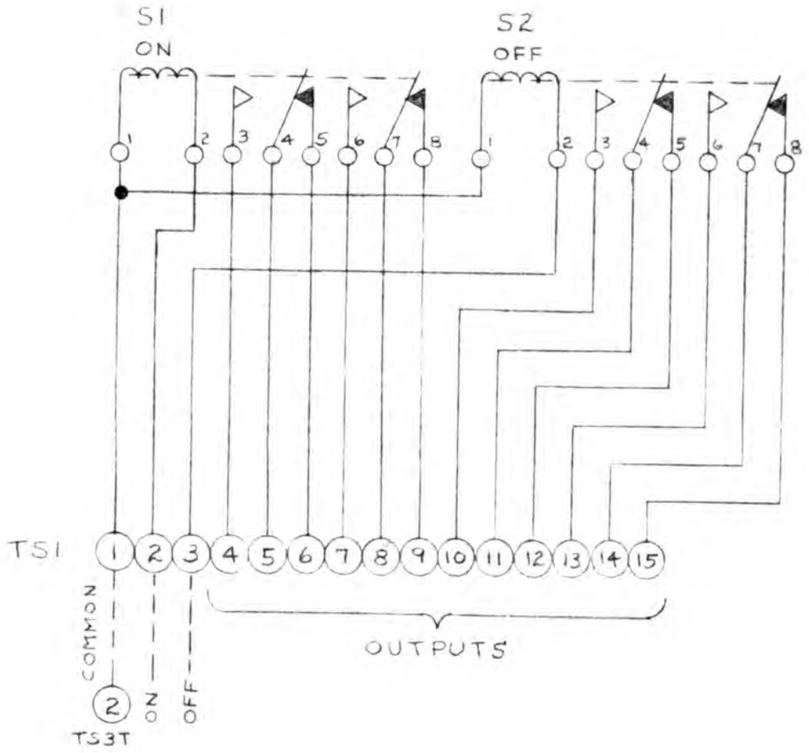

NOTES:
1. COIL WIRE CONNECTIONS — #22 GA. WIRE.
2. CONTACT WIRING — #16 GA. WIRE.
3. CONTACT RATING, 15 AMPS. AT 115 VAC NON-INDUCTIVE LOAD.
4. CONNECT TS1-2 AND -3 AT DESIRED SWITCH OUTPUT TERMINALS ON TS3T, TRC-T UNIT.

ITEM	PART NO.	MANUFAC.	DESCRIPTION
4	S2	OHMITE	SAME AS S1
3	S1	OHMITE	RELAY #DOSX-7T, DPDT, 115 VAC COIL
2	TS1	GEN. PRO.	TERMINAL STRIP #440-15
1	31120-B	CEMC	CHASSIS

USED WITH
31101-R
31120-B

MATL ———

FIN ———

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
MOMENTARY OUTPUT AUX. RELAY UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: ———

APP'D.	ENG.	DRAWN M.L.T. 7-21-61

31123-B

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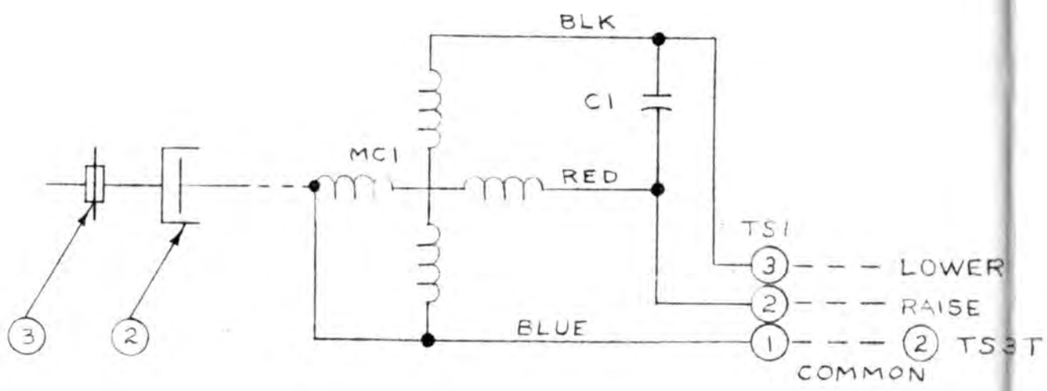

ITEM	PART NO	MANUFAC.	DESCRIPTION
6	MC1	BODINE	MOTOR # B8192E-600M, 2.8 RPM, 95 IN.-OZ.
5	C1	BODINE	CAPACITOR # K-45, 0.9 Mfd 200 VAC
4	TS1	GEN. PRO.	TERM. STRIP #440-3
3	3	NATIONAL	INSULATED FLEXABLE COUPLING #TX-9
2	2	C.E.M.C.	SLIP CLUTCH #5436-B
1	31127-B	CEMC.	CHASSIS

USED WITH
31101-R
31127-B

MATL _____

FIN _____

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. DEC. ANG.
±1/64 ±.015 ±1/2°

SYM	REVISIONS	DATE	APP

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
MOTOR & CLUTCH ASSEMBLY
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: ——

APP'D.	ENG.	DRAWN
		M.T. 7-19-61

31124-B

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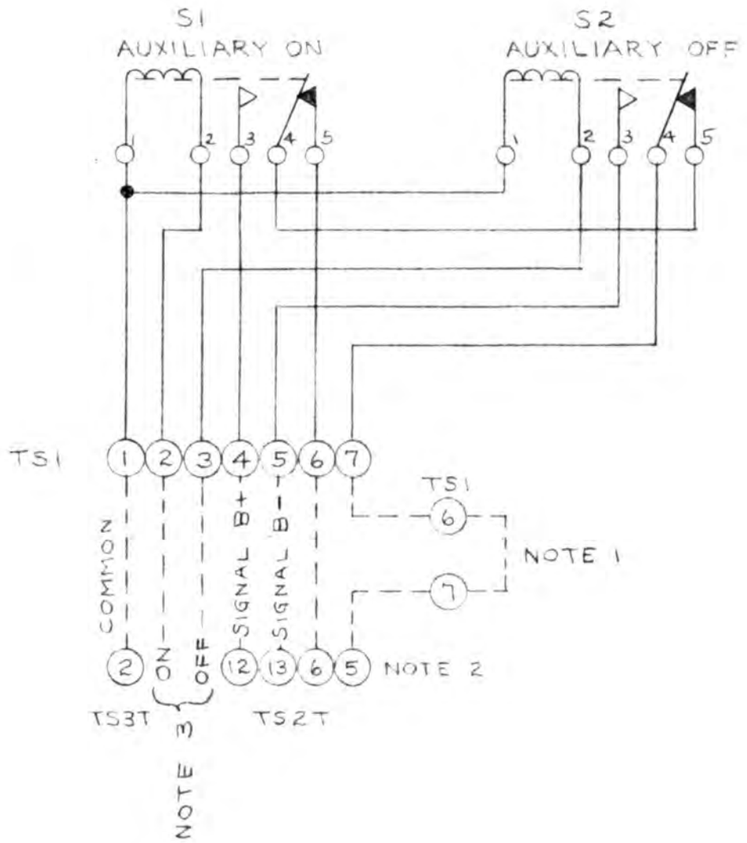

NOTES: 1. IF USED, SECOND # 31125-B REPORT-BACK UNIT CONNECTED IN SERIES, AS SHOWN.

2. REMOVE STRAP TS2T-5 TO -6.

3. CONNECT TS1-2 & -3 AT 6A OR 6B SWITCHING OUTPUT TERMINALS ON TS3T, TRC-T UNIT, IN PARALLEL WITH CONNECTIONS TO AUXILIARY SWITCHING UNIT AT THAT POINT.

ITEM	PART NO.	MANUFAC.	DESCRIPTION
4	S2	OHMITE	RELAY, DPDT, 115 VAC COIL, # DOSX-TT
3	S1	OHMITE	SAME AS S2
2	TS1	GEN. PRO.	TERM. STRIP #440-8
1	31120-B	C.E.M.C.	CHASSIS

USED WITH
31101-R
31120-B

MATL _____

FIN _____

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
A	TEAM STAR	8 30 61	CT

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
REPORT-BACK RELAY UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: _____

APP'D.	ENG.	DRAWN
		M.L.T. 7-26-61

31125-B

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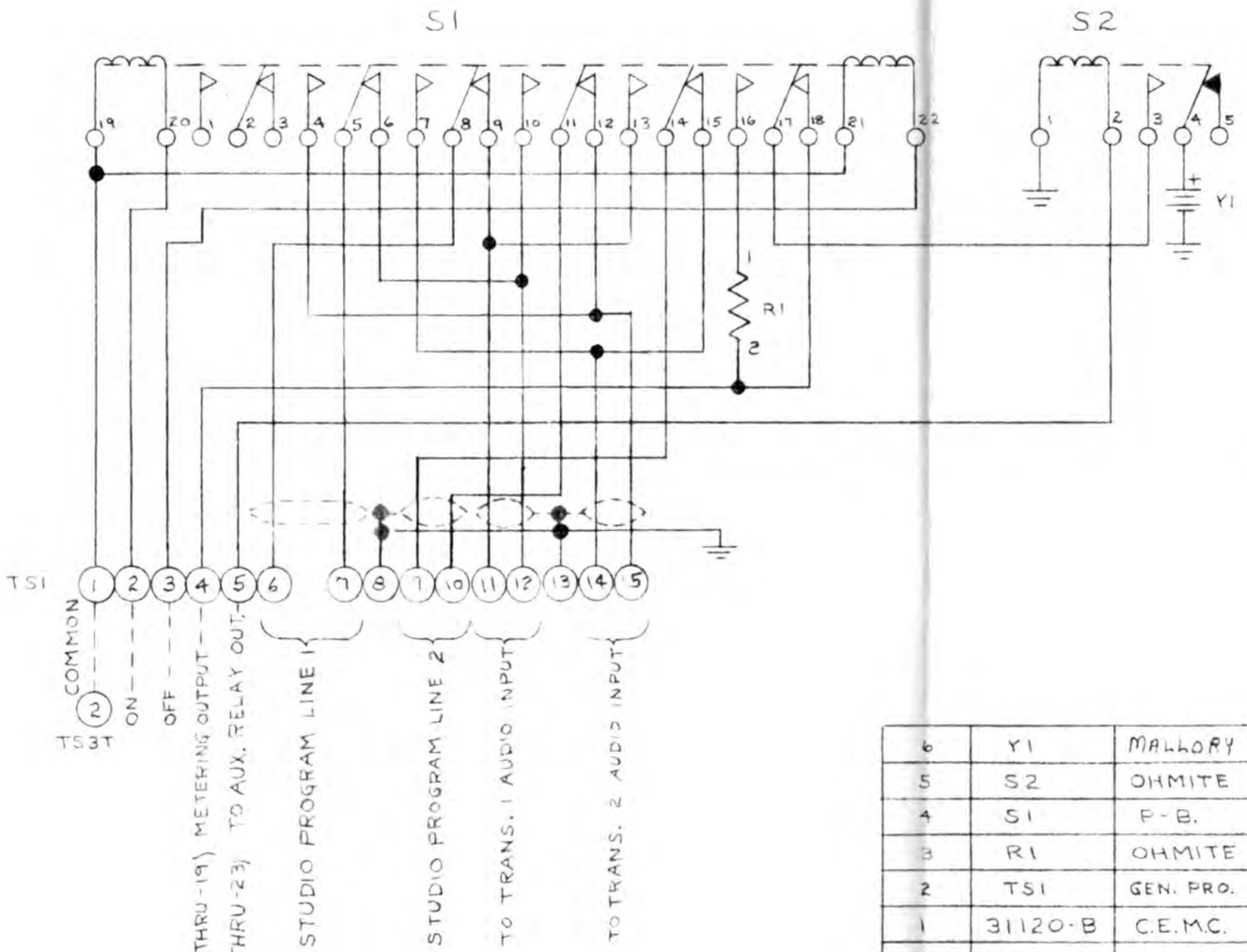

ITEM	PART NO.	MANUFAC.	DESCRIPTION
6	Y1	MALLORY	BATTERY # TR133 WITH # 44 HOLDER (ACME)
5	S2	OHMITE	RELAY, 2PDT, 110 VDC COIL, # DOSX-59T
4	S1	P-B.	RELAY, 6PDT. LATCHING, 115 VAC COIL, # KB 23AV
3	R1	OHMITE	RESISTOR, 47K, 2W, ± 10%
2	TS1	GEN. PRO.	TERMINAL STRIP #440-15
1	31120-B	C.E.M.C.	CHASSIS

USED WITH
31101-R
31120-B

MATL ———

FIN ———

UNLESS OTHERWISE SPECIFIED.
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
A	SHIELDING & R1 VALUE	9-22-61	CT

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
PROGRAM LINE REVERSING UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE: ———

APP'D.	ENG.	DRAWN
———	R.P.B	M.L.T.
———	———	7-26-61

31126-B

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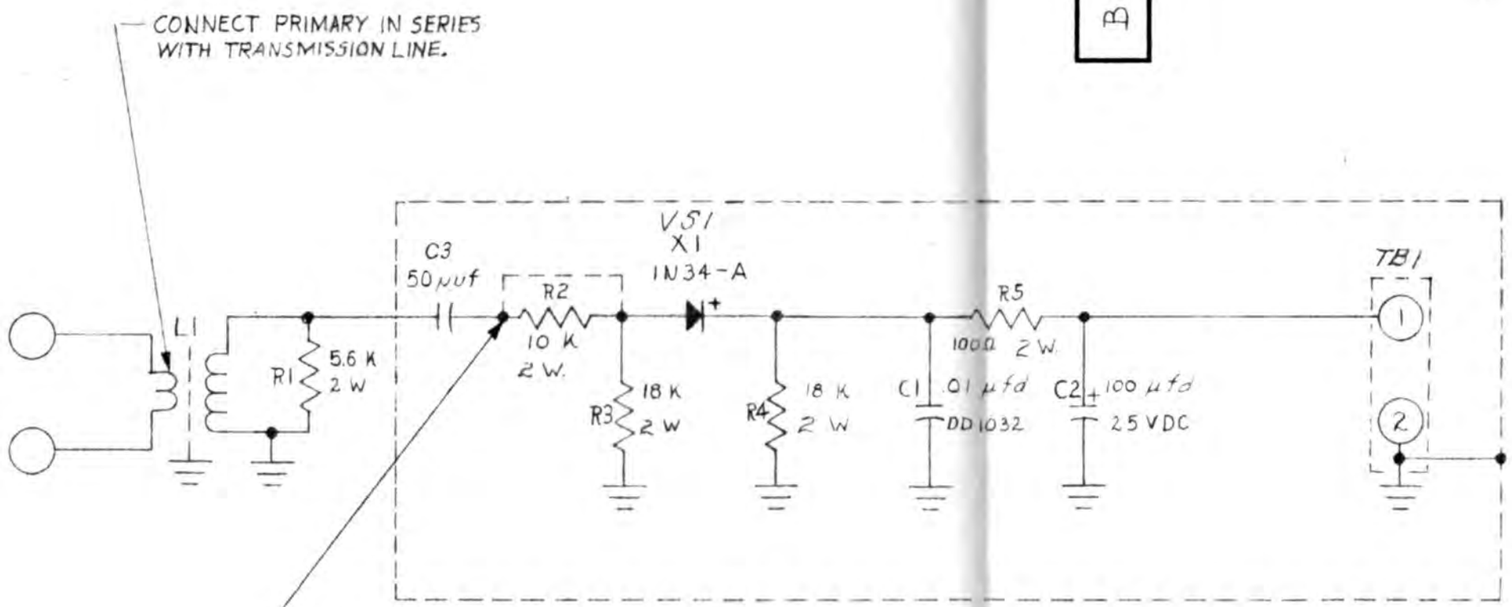
B 31099

B

REVISIONS

SYM	DESCRIPTION	DATE	BY	APPD
A	PER MARKED PRINT IN CONN. WITH ENG. CHG. 6-6-61	6-23-61	C.A.O.	
B	PER MKD. PRINT & ENG. CHG. DATED 7-6-61	7-13-61	C.A.O.	



REQD	ITEM	PART NUMBER	DWG SIZE	MFR CODE NO.	DESCRIPTION
	-2	D31761-2	D		ANTENNA CURRENT METERING UNIT, 15 AMPERES & ABOVE
	-1	D31761-1	D		ANTENNA CURRENT METERING UNIT, 15 AMPERES & BELOW

LIST OF MATERIAL

NEXT ASSY	DWG SIZE	USED ON	NEXT ASSY	FINAL ASSY
D31761	D	J0173		

APPLICATION | **QTY REQD**

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON: FRAC. ±1/64
2 PLACE DEC ±.02 | 3 PLACE DEC ±.010 | ANGLES ±0° 30'
MACHINED SURFACE FINISH 125 √
SURFACE ROUGHNESS PER MIL STD 10.
HOLE TOLERANCE PER AND10387.
ALL DIMENSIONS ARE IN INCHES AND ARE TO BE MET AFTER PLATING.
ECCENTRICITY BETWEEN ANY DIA.(S) ON THE SAME CENTERLINE SHALL NOT EXCEED .010 TOTAL INDICATOR READING.
REMOVE ALL BURRS AND SHARP EDGES.

DRAWN	R C SMITH	5-19-61
CHECK		
ENGR	R BUCKNER	5-19-61
APPD		
APPD		
RELEASE		

SCHEMATIC
ANTENNA CURRENT
METERING UNIT

SCALE | WEIGHT | DWG SIZE B

Continental Electronics MANUFACTURING COMPANY
DALLAS TEXAS

DWG NUMBER B 31099

MFR CODE | SHEET 1 OF 1

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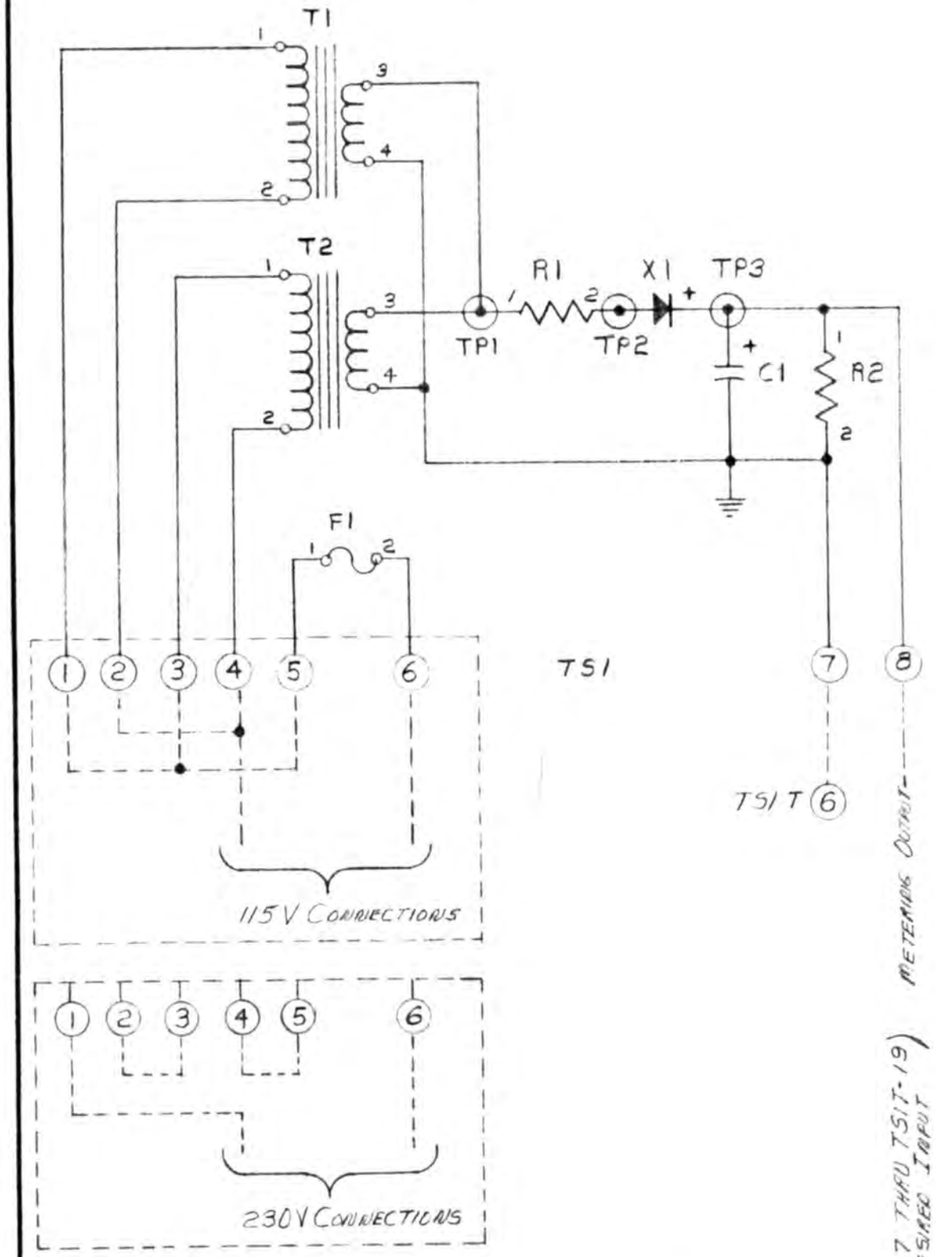

NOTES: 1. ALL WIRE IS #22 GA. EXCEPT TRANSFORMER LEADS.

ITEM	PART NO	MANUFAC.	DESCRIPTION
12	TP3	USECO.	SAME AS TP1
11	TP2	USECO.	SAME AS TP1
10	TP1	USECO.	INSULATED STANDOFF, #1417
9	X1	T. I.	DIODE, #1N2071
8	T2	C.T.C.	SAME AS T1
7	T1	C.T.C.	6.3V, 0.6A FILAMENT TRANSFORMER, #P6465
6	R2	OHMITE	RESISTOR, 10K, 2W, ±10%
5	R1	OHMITE	RESISTOR, 50 OHM, 10W, BROWN DEVIL
4	F1	LITTLE FUSE	#357001 HOLDER W/#313.062 1/16 A. SLO-BLO FUSE
3	C1	MALLORY	50mfd., 50V, #TC-39
2	TS1	GEN. PRO.	TERMINAL STRIP, #440-8
1	31120-B	C.E.M.C.	CHASSIS

USED WITH
31101-R
31120-B

MATL

FIN

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
A	TERM. STRIP	8-30-61	C.T.
B	FUSE SIZE & WIRE	11-1-61	C.T.
C	F1 WAS 312.062	11-20-61	FAB

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CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
LINE VOLTAGE METERING UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE:

APP'D.	ENG.	DRAWN
	R.P.B.	C.T. 8-22-61

31128-B

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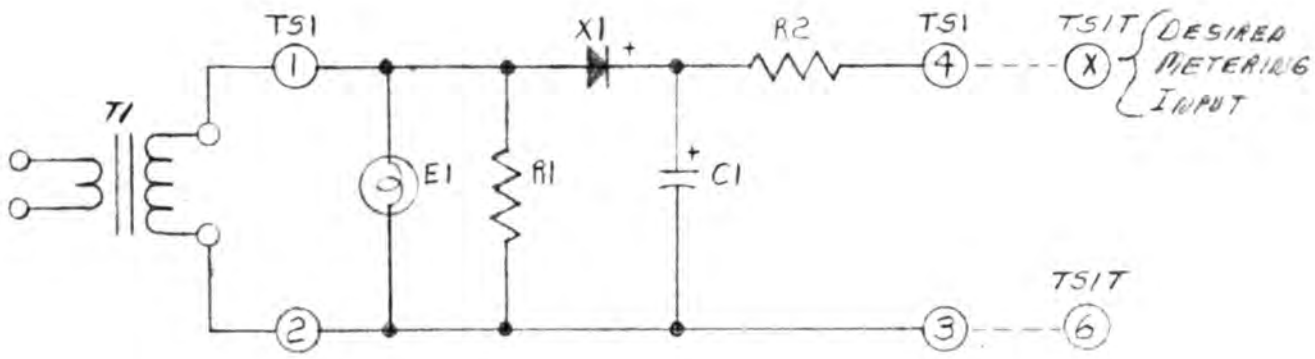

NOTES: 1. PRIMARY OF T1 IS CONNECTED IN SERIES WITH ONE SIDE OF TOWER LIGHT CIRCUIT. (3 TO 4 TURNS OF CIRCUIT WRAPED AROUND CORE)

2. R2 MAY BE REDUCED IN VALUE IF INSUFFICIENT OUTPUT IS OBTAINED

ITEM	PART NO.	MANUFAC.	DESCRIPTION
9	TS-2	CINCH	ENG. TYPE TERMINAL STRIP # 54-A
8	T1	SAJURA	CURRENT TRANSFORMER PER SCHEMATIC # 10775-B
7	TS-1	GEN. PRO.	4 POINT TERMINAL BOARD # 440-4
6	X1	SYLVANIA	DIODE, # 1N34-A
5	R2	OHMITE	4.7K, ½ W ±10% COMPOSITION
4	R1	OHMITE	220 OHM, 2W ±10% COMPOSITION
3	E1	EF JOHNSON	# 147-406-6 LAMP HOLDER W/ # 1488 BULB
2	C1	MALLORY	50 MFD, 50 V ELECTROLYTIC # TC-33
1	CU-2106-A	BUD	ALUMINUM MINIBOX, GRAY HAMMERTONE FINISH

USED WITH
3110-A
31136-B

MATL

FIN

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP
A	RELAWN	9-7-61	C.T

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CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

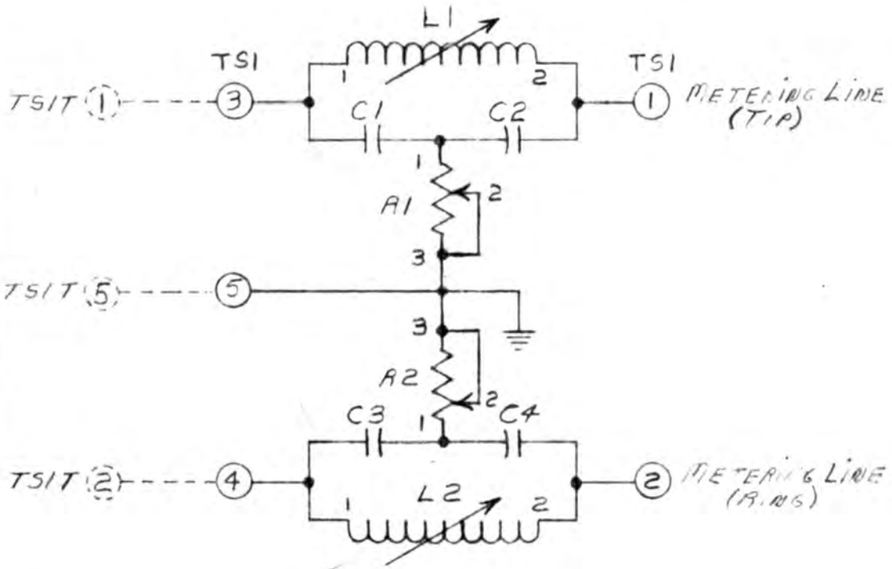
SCHEMATIC

TOWER LIGHTS METERING UNIT
TYPE TRC-3 REMOTE CONTROL SYSTEM

SCALE:

APP'D.	ENG.	DRAWN
	A.P.B.	C.T
		9-7-61

5522-A



NOTES: 1. CONNECT IN SERIES WITH METERING LINE; IF TYPE TRC-3-FA SYSTEM IS USED CONNECT BETWEEN TRC-3-T & TRC-FA3-T.

2. ADJUST L1, R1, & L2, R2 FOR MINIMUM INDICATION ON TRC-3 SYSTEM METERS. (THERE MAY BE SLIGHT INTERACTION BETWEEN ADJUSTMENTS)

ITEM	PART NO.	MANUFAC.	DESCRIPTION
10	R2	OHMITE	SAME AS R1
9	R1	OHMITE	10K 2W, POTENTIOMETER #CLU-1031
8	L2	U.T.C.	SAME AS L1
7	L1	U.T.C.	4 Hy 7 ma (+200%, -70%), VARIABLE INDUCTOR, # HVC-B
6	C4	C.D.	SAME AS C1
5	C3	C.D.	SAME AS C1
4	C2	C.D.	SAME AS C1
3	C1	C.C.	2 MFD, 200 V, # MP2W2
2	TSI	GEN. PRO.	TERMINAL STRIP #440-5
1	31130-B	C.E.M.C.	CHASSIS

USED WITH
31101-A
31130-B

MATL

FIN

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES
FRACT. ±1/64 DEC. ±.015 ANG. ±1/2°

SYM	REVISIONS	DATE	APP

CONTINENTAL ELECTRONICS MANUFACTURING CO.
DALLAS, TEXAS

SCHEMATIC
TELEPHONE LINE FILTER
TYPE TRC3 REMOTE CONTROL SYSTEM

SCALE:

APP'D.	ENG.	DRAWN
	A.P.B.	C.T.
		8-14-61

31129-B

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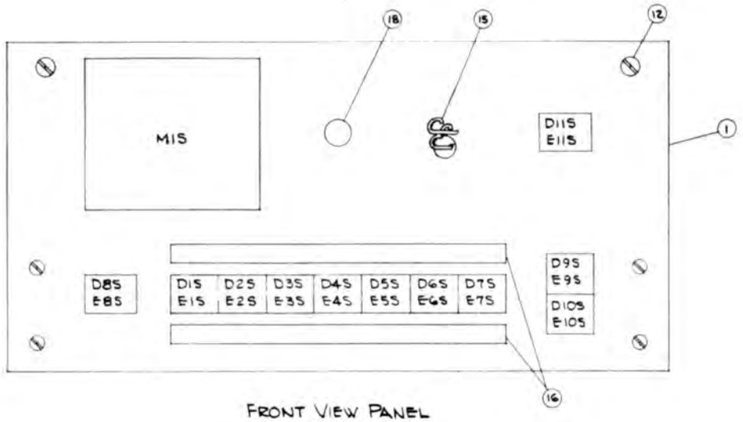
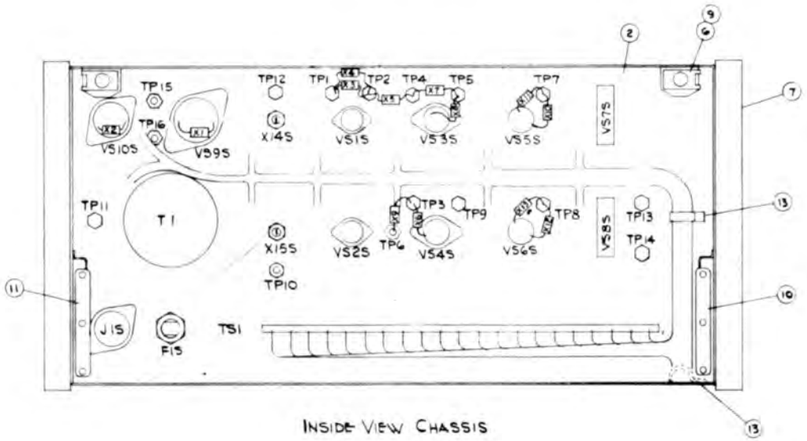
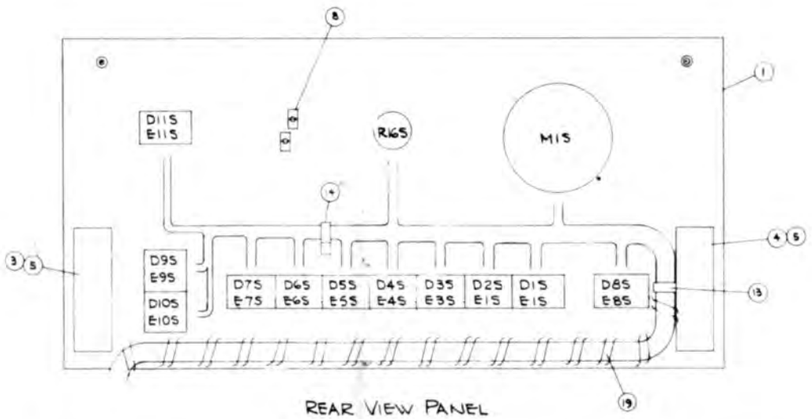
REVISIONS				
SYM	DESCRIPTION	DATE	BY	APPD
A	ADD TP4, TP15, & TP16	6/1/61	RA	
B	ADD DIODES	12-13-61	MDF	



FRONT VIEW PANEL



INSIDE VIEW CHASSIS



REAR VIEW PANEL

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ITEM	QTY REQD	PART NUMBER	DWG SIZE	MFR CODE NO.	DESCRIPTION
19					AMP # 500001-2 ¼ POLY SPIRAP
18	1				KNOB- DAVIES CO # 1450 WHITE
17	16				USECO #1917 STANDOFF INSULATOR (TP1 THRU TP16)
16	2	B-31082	B		CARD CARRIER
15	1				CEMCO EMBLEM 31519-1"
14	1				BRUNDY CABLE CLAMP-HP8N
13	3				BRUNDY CABLE CLAMP-HP6N
12	2				KNURLED HEAD SCREW - SOUTHCO 12-13-30 7/8 WITH TWO WASHERS
11	1				SUPPORT HINGE - NATIONAL LOCK 61-996 LEFT
10	1				SUPPORT HINGE - NATIONAL LOCK 61-996 RIGHT
9	2				TINNERMAN SPEED NUT - CB119-1024-F
8	2				TINNERMAN SPEED NUT - C12002Q12
7	2	5938-A	A		END FILLER
6	2	5517-A	A		BRACKET
5	2	5939-A-1	A		HINGE PAD CLAMP
4	1	5941-A	A		HINGE PAD RIGHT
3	1	5940-A	A		HINGE PAD LEFT
2	1	E-31070	E		CHASSIS
1	1	D-31068	D		FRONT PANEL

LIST OF MATERIAL

31100-E	E	10186		
NEXT ASSY	DWG SIZE	USED ON	NEXT ASSY	FINAL ASSY
APPLICATION			QTY REQD	

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON: FRAC. ±
2 PLACE DEC ± 3 PLACE DEC ± ANGLES ±
MACHINED SURFACE FINISH 125
ALL DIMENSIONS ARE IN INCHES AND ARE TO BE MET AFTER FINISHING.
ALL HOLES MUST MATCH CORRESPONDING HOLES IN ADJACENT PARTS AT ASSEMBLY.
REMOVE ALL BURRS AND SHARP EDGES

DRAWN M. HADDEN 7-6
CHECK
ENGR S. BUCKNER
APPD
APPD
RELEASE

ASSEMBLY
TRC-S STUDIO UNIT
TRC-3 TRANSMITTER
REMOTE CONTROL

Continental Electronics
MANUFACTURING CO.
DALLAS TEXAS

DWG NUMBER D-31104
SCALE 1/2 | WEIGHT | DWG SIZE D
MFR CODE 08440 | SHEET 1 OF 1

B
D-31104

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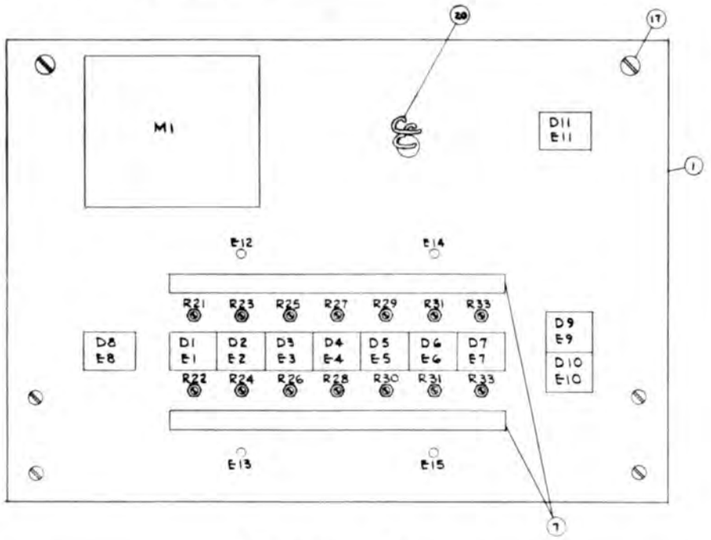
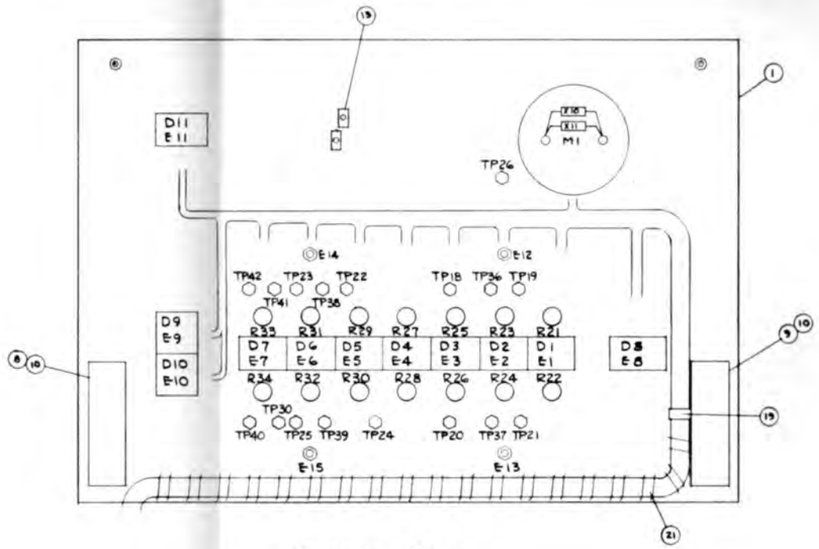
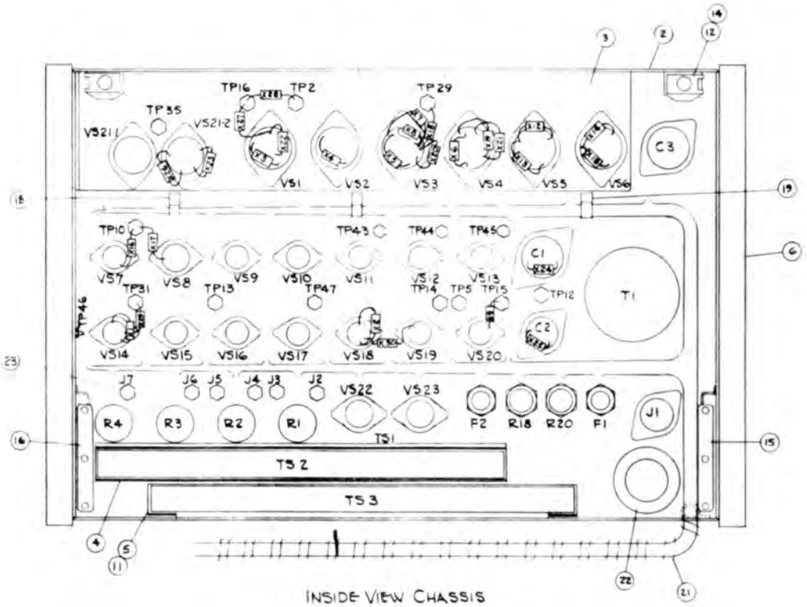
REVISIONS				
SYM.	DESCRIPTION	DATE	BY	APPD
A	ADD JUMPERS, DELETE TP32 & TP33	9/6/61	R.E.	
B	ADD DIODES	12-13-61	M.D.F.	



FRONT VIEW PANEL



REAR VIEW PANEL



INSIDE VIEW CHASSIS

	ITEM	PART NUMBER	DWG SIZE	MFR CODE NO.	DESCRIPTION
39	23				UTICO #1417 STANDOFF INSULATOR
1	22				GROMMET - AIR 2803 A
1	21				AMP #500001-2 1/4 POLY SPIRAP
1	20				CEMCO EMBLEM 31514-1
4	19				BRUNDY CABLE CLAMP-HP6N
1	18				BRUNDY CABLE CLAMP-HP5N
2	17				KNURLED HEAD SCREW-SOUTHCO 12-13-30 7/16" WITH TWO WASHERS
1	16				SUPPORT HINGE-NATIONAL LOCK 61996 LEFT
1	15				SUPPORT HINGE-NATIONAL LOCK 61996 RIGHT
2	14				TINNERMAN SPEED NUT-CB19-1024-F
2	13				TINNERMAN SPEED NUT-CL2002-012
2	12	5517-A	A		BRACKET
2	11	31096-A	A		BAR NUT
2	10	5939-A-1	A		HINGE PAD CLAMP
1	9	5940-A	A		HINGE PAD LEFT
1	8	5941-A	A		HINGE PAD RIGHT
2	7	B-31082	B		CARD CARRIER
2	6	B-31081	B		END FILLER
1	5	B-31079	B		MOUNTING BKT
1	4	B-31080	B		MOUNTING BKT
1	3	C-31078	C		CHASSIS-SUB MOUNTING
1	2	E-31071	E		CHASSIS
1	1	31069-E	E		FRONT PANEL

LIST OF MATERIAL

B

D-31105

31101-R	R	30180		NEXT ASSY	FINAL ASSY
NEXT ASSY	DWG SIZE	USED ON		QTY REQD	
APPLICATION					

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON: FRAC ±
2 PLACE DEC ± 3 PLACE DEC ± ANGLES ±
MACHINED SURFACE FINISH 125
ALL DIMENSIONS ARE IN INCHES AND ARE TO BE MET AFTER FINISHING.
ALL HOLES MUST MATCH CORRESPONDING HOLES IN ADJACENT PARTS AT ASSEMBLY.
REMOVE ALL BURRS AND SHARP EDGES

DRAWN M. BROOKS 6-9-61
CHECK
ENGR R. BUCKNER
APPD
APPD
RELEASE

ASSEMBLY
TRC-T TRANSMITTER UNIT
TRC-3 TRANSMITTER
REMOTE CONTROL

Continental Electronics MANUFACTURING CO. DALLAS, TEXAS

DWG NUMBER D-31105

SCALE 1/2 | WEIGHT | DWG SIZE D | MFR CODE 08440 | SHEET 1 OF 1

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1 February 63

SERVICE MEMORANDUM NO. 020163
(TRC-3 Memo. No. 8)

Subject: To correct numbering error
Recommended Modification
Type TRC-3 Remote Control System

In Service Memorandum No. 012963, the numbering of the zener diodes was listed incorrectly. The corrected text of this Service Memorandum is as follows: In Section 5, the TRC-3 instruction manual discusses filtering techniques which may be used in case of excessive AC hum on the metering telephone line. In a few cases it has been foun d that the existing hum is so severe as to cause up-scale readings with the filter in place. A modification may be made to the TRC-S unit which will greatly reduce or eliminate such error readings.

Referring to simplified metering schematic 31119-B, SELECT relays S3S and S4S are connected through biasing zener diodes X9S and X8S, thereby isolating the metering signal from these shunt paths to ground. The diodes break down at approximately 3.9 volts, and when hum voltage appears at the studio end of the metering line having peaks which exceed 3.9 volts, the diodes conduct and create an un balanced impedance path at these points. X9S conducts on negative peaks and X8S on positive peaks, thus providing a DC drop across M1S and causing a current flow in the metering circuit.

The effect may be minimized and eliminated in most cases by replacing X9S and X8S with Type 1N758 diodes. These have a zener voltage of 10.0 volts and will in most cases exceed the level of interferring AC signals.

Since this change will effectively reduce the sensitivity of S3S and S4S somewhat, it is suggested that dropping resistor R60T (3900 ohms) in the TRC-T unit be replaced with a direct connection. This change will increase the "Select A" report signal to the studio terminal.

Note that these modifications were performed in the field by CEMC personnel in a few cases, and the circuits in question should be inspected before changes are attempted. Serial Nos. 332 through 336, and 338 and above, will contain these changes as factory modifications.

R. P. BUCKNER

Distribution: Serial #302 through 331, 337.
CBS, NBC, and ABC, New York.

RPB/ebl

www.SteamPoweredRadio.Com

29 January 63

SERVICE MEMORANDUM NO. 012963
(TRC-3 Memo. No. 7)

Subject: Recommended Modification
Type TRC-3 Remote Control System

In Section 5, the TRC-3 instruction manual discusses filtering techniques which may be used in case of excessive AC hum on the metering telephone line. In a few cases it has been found that the existing hum is so severe as to cause up-scale readings with the filter in place. A modification may be made to the TRC-S unit which will greatly reduce or eliminate such error readings.

Referring to simplified metering schematic 31119-B, SELECT relays S3S and S4S are connected through biasing zener diodes S9S and S7S, thereby isolating the metering signal from these shunt paths to ground. The diodes break down at approximately 3.9 volts, and when hum voltage appears at the studio end of the metering line having peaks which exceed 3.9 volts, the diodes conduct and create an unbalanced impedance path at these points. X9S conducts on negative peaks and X7S on positive peaks, thus providing a DC drop across M1S and causing a current flow in the metering circuit.

The effect may be minimized and eliminated in most cases by replacing X9S and X7S with Type IN758 diodes. These have a zener voltage of 10.0 volts and will in most cases exceed the level of interferring AC signals.

Since this change will effectively reduce the sensitivity of S3S and S4S somewhat, it is suggested that dropping resistor R60T (3900 ohms) in the TRC-T unit be replaced with a direct connection. This change will increase the "Select A" report signal to the studio terminal.

Note that these modifications were performed in the field by CEMC personnel in a few cases, and the circuits in question should be inspected before changes are attempted. Serial Nos. 332 through 336, and 338 and above, will contain these changes as factory modifications.

,R. P. BUCKNER

Distribution: Serial #302 through 331, 337.
CBS, NBC, and ABC, New York

RPB/ebl NOTE: NOT TO BE INCORPORATED IN FM TRC-3 UNLESS NEED ARISES.

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