FUNCTIONAL DESCRIPTION

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RF-CONTROL CHASSIS (TLN2472B, 74B, 75B) (B VERSION) .................. 68P81070E88

REMOTE CONTROL

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LINE DRIVER (TRN5235A, 36A, 37A) .................................................. 68P81062E13
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R1 AUDIO & SQUELCH MODULE (TRN5068A, 69A) .................................................. 68P81062E57
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Spectra-TAC 4-WIRE LINE DRIVER MODULE (TRN5294A) .................................................. 68P81062E41
Spectra-TAC ENCODER MODULE (TRN5293A) .................................................. 68P81062E42
Spectra-TAC SQUELCH GATE MODULE (TRN5331A) .................................................. 68P81062E43
MSR 2000 BASE AND REPEATER STATION MULTIPLE TONE
PL OPTIONS (C158, C261, C262, C263) .................................................. 68P81112E80
MULTIPLE PL MATRIX CONTROL MODULE (TRN5330A) .................................................. 68P81062E67
MULTIPLE PL ENCODER MODULE (TRN5292A) .................................................. 68P81062E68
MULTIPLE PL ENCODER MODULE (TRN5329A) .................................................. 68P81062E69

68P81061E40
1. INTRODUCTION

The remote control modules permit remote wire line control of base station and repeater (RT) stations. The following modules are provided with the station dependent upon the type of station control and operation.

2. STANDARD MODULE DESCRIPTION

2.1 STATION CONTROL MODULE
(DC and Tone Controlled Station)

This module provides the necessary integration of control functions from other modules in the remote chassis to key the station transmitter. Exciter audio amplification is also provided with amplitude adjustment by means of a potentiometer which is accessible through the front panel. Amplifiers are also provided to amplify the receiver discriminator output which is used externally.

2.2 LINE DRIVER MODULE
(DC and Tone Controlled Stations)

The line driver module amplifies the receiver audio which is routed to the remote control point over wire line, and amplifies audio from the remote control point which is to be transmitted. Thus, it also provides monitoring of all repeater messages. For a repeater (RT) station that is not to be wire line controlled, this module can be omitted.

The line driver module is available in three models: 1-receiver, 2-wire (standard); 2-receiver, 2-wire (standard with 2-receiver base stations); and 4-wire (optional). The 4-wire line driver permits the transmit and receive audio to be carried on separate wire lines, or permits receive No. 2 audio to be carried on a separate wire line.

2.3 DC TRANSFER MODULE
(DC Controlled Stations)

The dc transfer module converts dc line currents to control functions for use by a remote control console operator via wire lines. Six dc transfer module versions are available and perform the functions shown in Table 1.

2.4 GUARD TONE DECODER
(Tone Controlled Stations)

The guard tone decoder converts a 2175 Hz guard tone signal received from a remote control source to a line push-to-talk voltage. The decoder also amplifies and distributes received function tones to other function decoders.

2.5 F1-CS AND F1-PL CONTROL MODULES
(Tone Controlled Stations)

Both modules convert a 1950 Hz tone signal from a remote control source to a switched ground to turn on the transmitter channel element. The F1-PL module also converts a 2050 Hz tone signal to a switched ground to disable the PL operation of the receiver for channel monitoring before transmitting. In carrier squelch stations, the PL disable function is not required and is therefore not used.

Table 1. DC Transfer Module Application

<table>
<thead>
<tr>
<th>Module</th>
<th>Line Current (mA)</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-CS</td>
<td>3.5</td>
<td>Keys transmitter on PL</td>
</tr>
<tr>
<td>F1-PL</td>
<td>3.5</td>
<td>Keys transmitter on PL, PL disabled receiver</td>
</tr>
<tr>
<td>C1-R2</td>
<td>3.5</td>
<td>Keys transmitter on PL and select R2</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>PL disable receiver</td>
</tr>
<tr>
<td>F2-R2 More</td>
<td>3.5</td>
<td>Keys transmitter on PL</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>PL disable receiver</td>
</tr>
<tr>
<td>Mute R2</td>
<td>5.5</td>
<td>Mute R2</td>
</tr>
<tr>
<td>Paging (Optional)</td>
<td>12.5</td>
<td>Keys transmitter on PL without PL tone</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>PL disable receiver</td>
</tr>
<tr>
<td>Repeater</td>
<td>5.5</td>
<td>Keys transmitter on PL</td>
</tr>
<tr>
<td>Control (Optional)</td>
<td>12.5</td>
<td>Keys transmitter on PL, PL tone, PL disable receiver</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>Repeater turn-on</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>PL disable receiver</td>
</tr>
<tr>
<td>Repeater</td>
<td>5.5</td>
<td>Repeater turn-off</td>
</tr>
</tbody>
</table>

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2.6 F2 TONE DECODER MODULES
(Tone Controlled Stations)

The F2 tone decoder module is available in four versions which perform the functions shown in Table 2.

<table>
<thead>
<tr>
<th>Module Version</th>
<th>Function Tone (Hz)</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2 Control</td>
<td>1850</td>
<td>Keys transmitter on F2.</td>
</tr>
<tr>
<td>C1-R2</td>
<td>1830</td>
<td>Keys transmitter on F2.</td>
</tr>
<tr>
<td></td>
<td>1790</td>
<td>Selects R1, inhibits R2.</td>
</tr>
<tr>
<td></td>
<td>1650</td>
<td>Selects R2, inhibits R1.</td>
</tr>
<tr>
<td>F2-R2-Mute (Optional)</td>
<td>1850</td>
<td>Keys transmitter on F2.</td>
</tr>
<tr>
<td></td>
<td>1790</td>
<td>Mutes R2.</td>
</tr>
<tr>
<td></td>
<td>1650</td>
<td>Unmutes R2.</td>
</tr>
<tr>
<td>PAGING (Optional)</td>
<td>1850</td>
<td>Keys transmitter on F1 without PL modulation.</td>
</tr>
</tbody>
</table>

2.7 SQUELCH GATE MODULE
(Repeater Stations)

The squelch gate module is used in all repeater (RT) stations, dc or tone controlled, or non-wire line controlled. The squelch gate module produces an output to activate the transmitter when a carrier signal is received that has sufficiently high signal-to-noise ratio. Private-Line stations also require decoding of the proper PL code in addition to receiving a strong carrier signal.

2.8 TIME-OUT TIMER MODULE
(Repeater Stations)

The time-out timer (T-O-T) module is standard in all repeater (RT) models and is an optional accessory for base station models. It limits the period of time the transmitter can be keyed. It can be set to limit the continuous transmission time from line controlled operation, and to limit the transmission time of individual users of the repeater. The time-out start of each is independent of the other. The unit can be preset for 1/2, 1, 2, 4 or 8 minutes by connecting jumpers to the corresponding time multiplier output.

3. OPTIONAL MODULE DESCRIPTION

3.1 SINGLE-TONE DECODER MODULE
(DC and Tone Controlled Stations)

The single-tone decoder module provides a transistor switched output (logic low or high) or an optional relay closure upon receipt of the proper tone. The module responds only to a specific audio tone of at least 300 milliseconds duration. Nineteen different frequencies from 600 to 3300 Hz at 150 Hz intervals are available. The module can be jumpered so the output is latched on (must be reset by an external command), momentarily on, or 5 seconds on. The single-tone decoder module can be used to control other functions as described in the following examples.

In repeater (RT) stations, the module may be used to inhibit repeater operation until the correct audio tone is received by the receiver. In this application, it is operated in the latched mode and is reset by the squelch gate upon loss of received carrier signal.

In base or repeater stations, the output of the module can be wired to inhibit (mute) receiver audio until the proper tone is received.

3.2 OPTION DECODERS

A tone controlled station may use one of the following decoders.

3.2.1 Four-Frequency Control Module
(Tone Controlled Stations)

The four-frequency control module converts the proper function tones into frequency selection commands for selection of the station operating frequency. Refer to Table 3 for a listing of the necessary function tones. This control module also includes front chassis mounted switches which permit local frequency selection, when desired. The four-frequency control module operates with a F1-CS or F1-PL control module compatible with four-frequency operation. These F1 control modules provide biasing voltage for the four-frequency module and include the 2175 Hz notch filters.

<table>
<thead>
<tr>
<th>Function Tone</th>
<th>Frequency Selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850 Hz</td>
<td>F1: Transmitter keys on frequency F1. Receiver operates in standby mode on frequency F1.</td>
</tr>
<tr>
<td>1790 Hz</td>
<td>F2: Transmitter keys on frequency F2. Receiver operates in standby mode on frequency F2.</td>
</tr>
<tr>
<td>1650 Hz</td>
<td>F3: Transmitter keys on frequency F3. Receiver operates in standby mode on frequency F3.</td>
</tr>
<tr>
<td>1250 Hz</td>
<td>F4: Transmitter keys on frequency F4. Receiver operates in standby mode on frequency F4.</td>
</tr>
</tbody>
</table>

3.2.2 Squelch Control Module

This module converts the 1450 Hz and 1550 Hz function tone burst to two levels of squelch sensitivity in the carrier squelch mode of receiver operation.

3.2.3 Private-Line Control Module

This module converts the 1450 Hz and 1550 Hz function tone bursts to PL or carrier squelch mode of operation. It differs from the PL disable function of the F1-PL module in that the receiver does not revert to PL operations when the transmitter is keyed. When this module is operated in the PL mode, the PL disable function of the F1-PL module is unaffected to allow monitoring before transmitting.
3.2.4 Repeater Control Module

This module may be used in a repeater (RT) station only. It converts a 1450 Hz function tone to a repeater enable command (repeater "set-up") and a 1550 Hz function tone to repeater disable (repeater "knock-down"). In the repeater "knock-down" mode the station operates as a conventional base station only.

3.3 "WILD CARD" CONTROL MODULE

This module may be added to any model station. It provides four tone-activated transistor switched outputs which may be used to control the operation of four relays in response to function tone commands of 1350, 1250, 1150 and 1050 Hz. The circuits may be cross-connected to two on-off outputs if desired. The outputs may be used for any desired remotely controlled switching at the base station site such as on-off control of antenna tower lights, emergency power generating equipment, etc.

3.4 TLN4151A RELAY KITS

The Model TLN4151A Relay Kits are for use in the "Wild Card" module, single-tone decoder module, or squelch gate module. They provide a form "C" output circuit which is isolated from the module board circuitry, with higher voltage and current switching capability than provided by the normal transistor output.