

TL MICROWAVE RADIO INSTALLATION AND OPERATION OPERATION — ORDER WIRE AND ALARM

1. GENERAL

1.01 The TL microwave radio order wire and alarm circuit provides:

- (a) Voice transmission between all radio stations and the order-wire and alarm control station.
- (b) Extension of the order wire from the control station, the far terminal radio station, and a carrier spur station.
- (c) Alarms from all radio stations to indicate power, transmission, and tower light failure or a signal-in indication.

2. METHOD OF OPERATION

A. Alarm Indication

2.01 When the radio system is operating normally and no alarm conditions exist, the PILOT lamp on the order-wire and alarm control panel is lighted. When an alarm is initiated by any radio station in the system, the PILOT lamp is extinguished and about 35 seconds later the ALM lamp lights and the office alarm is sounded. Unless the alarm is due to a break in radio transmission, the PILOT lamp will light again shortly after the ALM lamp is lighted. When responding to an alarm, the attendant should first depress the ACO key to silence the office alarm. If the alarm was caused by anything other than a complete break in radio transmission, depressing the ACO key will extinguish the ALM lamp as well as silence the office alarm. If the alarm was caused by a break in radio transmission, depressing the ACO key will silence the office alarm, but the ALM lamp will remain lighted and the PILOT lamp will remain extinguished. After depressing the ACO key, a telephone set should be inserted into the TEL

jacks to determine if anyone desires to communicate with the control station over the order wire since the alarm may have been a signal-in indication.

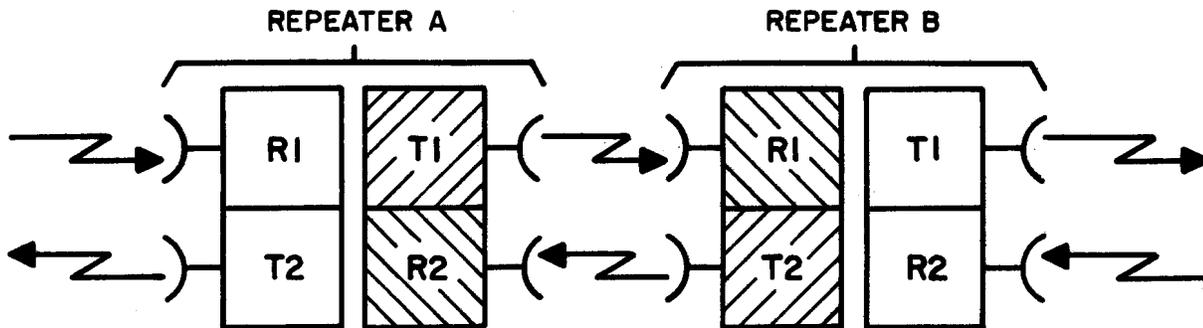
2.02 If the alarm was not a signal-in indication, the attendant should interrogate the system by depressing each station key, in order, from left to right, while listening on the order wire to determine the location and nature of the trouble as listed in Table A.

2.03 At stations provided with the TL radio alarm encoder, provisions are made so that if an alarm of high priority comes in while an alarm of lower priority is in effect, the higher priority alarm condition will initiate a new alarm at the control station and, upon interrogation, the attendant will hear the code for the high priority alarm in place of the code for the lower priority alarm. Also, if two alarm conditions exist at the same time and the higher priority alarm clears out, the lower priority alarm will initiate a new alarm at the control station and, upon interrogation, the attendant will hear the code for the lower priority alarm condition in place of the code for the higher priority alarm condition. For the case of an ac power failure at a station equipped with the alarm encoder, alarms will be received at the control station both when the ac power fails and when it is restored. When power is restored, the attendant will respond to the alarm and, upon interrogation, find an uninterrupted tone returned from the station in question, indicating that the ac power has been restored and that no other alarm conditions exist.

2.04 The attendant should take whatever action is necessary to correct the trouble indicated.

TABLE A		
AUDIBLE CODE RECEIVED	NATURE OF FAILURE	
	STATION WITH TOWER LIGHTS	STATION WITHOUT TOWER LIGHTS
Steady tone	No trouble	No trouble
Three short tones	AC failure or both top lights out	Not used
Two short tones	Flasher failure	Not used
Uniform pulses	Low battery or lightning arrester failure	AC failure, low battery, or lightning arrester failure
Silence	Diversity switch or transmission failure	Diversity switch or transmission failure
One short and one long tone	One top light or one or more side lights out	Not used

Note: With reference to Table A, all received codes with the exception of the silence condition indicate that the trouble is at the particular station being interrogated. For an explanation of silence conditions, refer to Fig. 1 and 2.

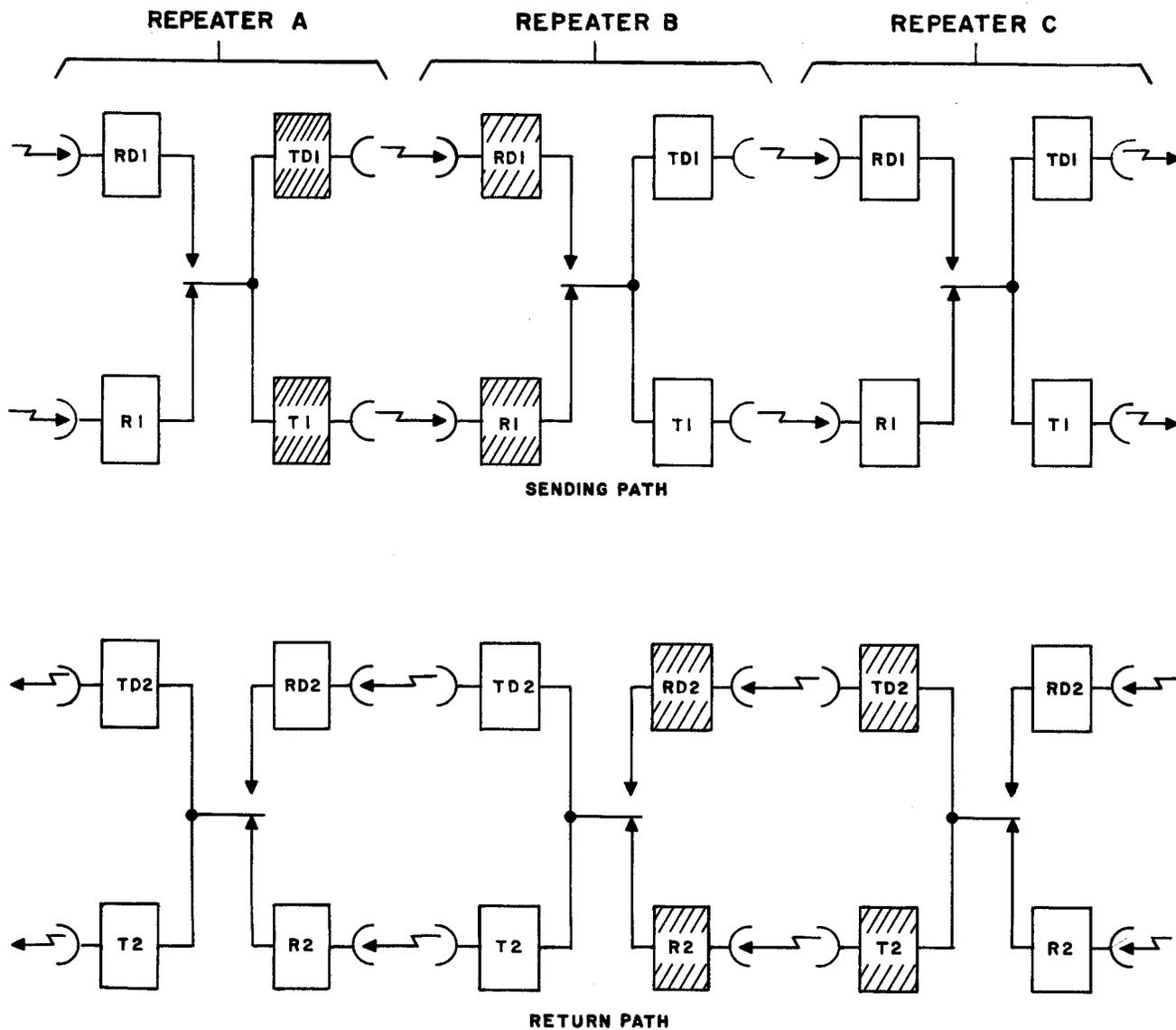


THE ABSENCE OF A RETURNED TONE FROM REPEATER B MAY BE DUE TO A FAILURE OF ANY ONE OF THE FOLLOWING EQUIPMENTS

1. TRANSMITTER T1 AT A.
2. RECEIVER R2 AT A.
3. TRANSMITTER T2 AT B.
4. RECEIVER R1 AT B

NO TRANSMISSION WILL BE POSSIBLE BEYOND THE BREAK IN TRANSMISSION; THEREFORE NO TONES WILL BE RETURNED FROM ANY STATION BEYOND REPEATER B.

Fig. 1 - Nondiversity System — Trouble Location



A TRANSMISSION FAILURE, AS INDICATED BY THE ABSENCE OF THE INTERROGATION TONE ASSOCIATED WITH REPEATER B, MAY BE DUE TO A FAILURE OF

- (1) RECEIVER R1 OR RD1 AT REPEATER B OR TRANSMITTER T1 OR TD1 AT REPEATER A IN THE SENDING PATH, OR
- (2) TRANSMITTER T2 OR TD2 AT REPEATER C OR RECEIVER R2 OR RD2 AT REPEATER B IN THE RETURN PATH.

Fig. 2 - Diversity System — Trouble Location

SECTION 409-301-300

B. Use of Order-wire Facilities

2.05 To communicate with the control station from any radio station, insert the headset into the TEL jack, operate the DIR key to the NEAR position, and depress the SIG key downward. The SIG lamp shall light, indicating an interruption of the 2600-cps pilot tone. After the attendant answers, be sure to release the SIG key since the alarm circuit is disabled while the SIG key is operated. The SIG lamp shall extinguish.

Note: While the SIG key is operated, the attendant at the near or far terminal or any repeater will be able to hear the attendant at the control station, but will not be able to talk to him. This feature was purposely created to emphasize the fact that

the SIG key must be released after signaling the control center in order that the alarm system will not be disabled.

2.06 The DIR key should be operated to the NEAR position when communicating with a station closer to the control point, and to the FAR position when communicating with a station farther from the control point. The SPUR position is used when communicating with a station on a spur route.

2.07 The control station cannot signal out on the order-wire circuit. Signaling between noncontrol stations is also not possible. Order-wire conversations can be carried on between any type of station; however, a prearranged schedule must be made.