TYPE F SIGNALING
2600-HZ TONE SUPPLY AND TRANSFER
CIRCUIT SD-1C224-01
DESCRIPTION

1. GENERAL

1.01 This section describes the 2600-Hz tone supply and transfer circuit used in the type-F signaling system.

1.02 The tone supply and transfer circuit supplies 2600 ±1-Hz tone to type-F single-frequency signaling units. The output level between ground and each of its output leads is .246 ±.01 volts. The output impedance of the tone supply is approximately 1.5 ohms.

1.03 The tone supply and transfer circuits employ printed board circuitry and solid state components. The circuits are contained in a plug in a device approximately 2 inches high by 8 inches wide. Two tone supply and transfer circuits take up the space of one standard 2-inch mounting plate. On the face of the tone supply and transfer unit is a locking device. To remove the unit from the bay, loosen the locking device by pulling it forward and the unit can then be removed by pulling it forward.

1.04 The standard arrangement calls for two units per bay which are designated ODD and EVEN. When both units are in their in-service positions, the 2600-Hz oscillator circuit of the ODD unit is monitored by the transfer circuit of the EVEN unit and likewise with the EVEN units oscillator and ODD units transfer circuit. In the event of an oscillator failure, the transfer circuit in the opposite unit would detect the failure and transfer the load from the bad oscillator to the good one. See Fig. 1.

1.05 The two-tone supply and transfer circuits supply a maximum of 132 signaling units. Under normal operating conditions, counting from the top of the bay down, the ODD oscillator supplies the odd numbered shelves (1st, 3rd, 5th, 7th, 9th, and 11th) and the EVEN oscillator supplies the even numbered shelves (2nd, 4th, 6th, 8th, and 10th). The distribution of tone can be broken down even further. Each oscillator output is subdivided into two groups. In the case of the ODD oscillator, one of its outputs supplies the oddnumbered signaling units on the odd shelves and the other output supplies the even numbered signaling units on the odd shelves. The same would also be true with the EVEN oscillators outputs supplying the odd and even units on the even numbered shelves (Fig. 1).

1.06 Each signaling unit in the bay has a resistor mounted in it that is connected across the tone leads (TN and TG) when 2600-Hz tone is to be transmitted. This arrangement differs from the method used in other single-frequency signaling systems whereby the protective resistors are mounted on a distribution panel at the top of the bay.

1.07 The source of the 2600-Hz tone is a stable tuned reed selector (S1 Fig. 1) consisting of a coil magnetically coupled to a reed that is tuned to 2600-Hz. The tuned reed selector is coupled to a 2-stage buffer amplifier by transformer T1. The output of the amplifier stage connects to transformer T2 which has a 2-phase center tapped output to the signaling units. TP1 and TP-2 on the face of the tone supply and transfer unit connect to the output leads and provide for the monitoring and testing of the unit. There is a phase reversal between TP1 and TP2 (Fig. 1). A phase reversal is also realized between odd and even numbered units on the same shelf.

1.08 The tone supply circuit utilizes automatic gain control (AGC) circuitry. The AGC circuit provides for regulation of the tone supplies amplifier circuit, and also provides a dc voltage output to the transfer circuit in the opposite tone supply and transfer unit.

1.09 The transfer circuit consists of a balanced dc bridge, a TR relay operate circuit, and a TR relay. The balanced bridge circuit monitors the AGC output from the tone supply in the other unit. It will function if the dc voltage is either above or below its circuit requirements. An unbalanced condition of the bridge circuit causes the TR relay to operate. The TR relay operating transfers the load to the good oscillator and closes alarm leads to the office alarm frame.

1.10 The two tone supply and transfer circuits are powered by -48 volt to -24 volt converter circuit. The converter unit in position number one in the bay supplies the ODD tone supply and transfer circuit, and the converter unit in position number two of the bay supplies the EVEN tone supply and transfer unit.

1.11 Test points TP1 and TP2 (Fig. 1) are provided for monitoring and making in-service bridged measurements of output level and output frequency of the tone supply.

1.12 There are no field adjustments on the tone supply and transfer circuits. No attempt should be made by field forces to make adjustments or repair defective units. A defective unit should be replaced with a good one obtained from local supply. Defective units should be returned to Western Electric Co. repair centers.

2. OPERATIONAL PRINCIPLES

2.01 A simplified schematic, showing basic elements of the tone supply and transfer circuits as they are interconnected, appears in Fig. 1. The output of the ODD oscillator is wired through the contacts of the nonoperated TR relay in the EVEN unit, and likewise, the output of the EVEN oscillator is wired through nonoperated contacts of the TR relay in the ODD unit. An oscillator failure in one unit will cause the TR relay to operate in the other unit. Contacts of the TR relay switch the load of the defective oscillator to the good one.

2.02 The transfer circuit is preset to operate the TR rely and transfer the load of the defective tone supply under any one of the following conditions: (1) If the output voltage of the tone supply rises above .385 ±.06 volts. (2) If the output voltage of the tone supply falls below .176 ±.038 volts. (3) If the output load impedance is less than 1 ohm. Audible and visual alarm conditions would exist when a transfer occurs. There are two different types of alarms. In the event that one of the oscillators should fail, the TR relay in the opposite unit operates and closes alarm leads to the office alarm frame. A minor audible alarm condition would exist and the ALM lamp in the defective unit would be lighted. Should both oscillators fail, a major audible alarm would exist and both ALM lamps would be lighted.

2.03 Alarm conditions can be restored by operating the RST key associated with the unit that has the lighted lamp. Ordinarily, a failure to restore to normal would indicate a defective unit, and should be replaced with a spare unit obtained from local supply. ***No attempt should be made to make adjustments on units failing to restore to normal.***

3. MISCELLANEOUS

3.01 One tone supply and transfer circuit may be removed from service without causing a service interruption. Removal of an equipment assembly will not actuate an alarm. When placing a good unit back in service, a minor alarm condition will exist. If it is not retired automatically within a few seconds, it can be restored by momentarily depressing the RST key on the unit with the lighted lamp.

3.02 Section 179-360-501 describes a method for making out-of-service tests on the Tone Supply and Transfer circuit. Other related components of the F type signaling system can be found in the 179-000-000 division.

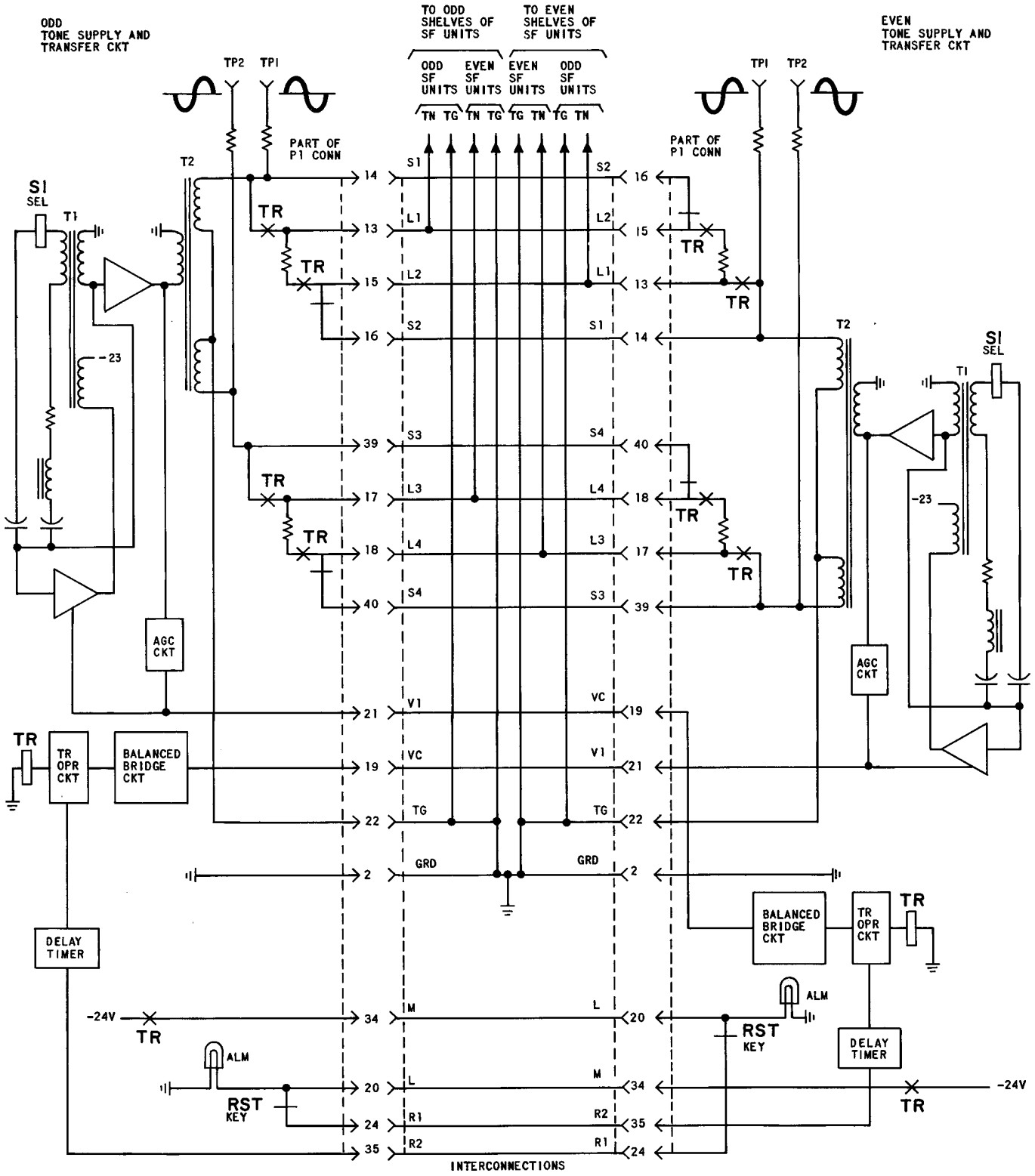

Fig. 1—Tone Supply and Transfer Circuits