COMMON SYSTEMS
"O" & "ON" CARRIER TELEPHONE
O1 REPEATER OSCILLATOR &
MISC. OSCILLATOR &
ON1 MISC. OSCILLATOR CKTS.

CHANGES

B. CHANGES IN APPARATUS

Superseded	Superseded By
1 - Capacitor (C2) KS-8332 75 μμf	1 - Capacitor (C2), KS-8382 75 μμf

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Options "N" and "R" were added to cover B.1 above. Option "N" only was previously shown and not rated "Mfr. Disc."

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 2230-DDS-WAD:GNJ

COMMON SYSTEMS "O" & "ON" CARRIER TELEPHONE O1 REPEATER OSCILLATOR & MISC. OSCILLATOR & ON1 MISC. OSCILLATOR CKTS.

CHANGES

B. CHANGES IN APPARATUS

B.1

Removed	Replaced by
1-Capacitor (C3) KS-13365, L1 890 μμf	1-Capacitor (C3) KS-13368, L1 1300 μμf
1-Capacitor (C6) KS-13368, L11 6860 μμf	1-Capacitor (C6) KS-13368, L11 6800 μμf

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Option "A" was expanded to make provision for strapping resistor (R6) out of the circuit.

D.2 Circuit note 103 was added.

All other headings under "Changes", no change.

1. PURPOSE OF CIRCUIT

1.1 This circuit provides, for both directions of transmission, a carrier for the frequency "frogging" modulation process of an "OB1", "OC1" or OD1 carrier repeater.

1.2 The circuit provides a 38 kc carrier frequency for use with a OA1 loop test unit.

1.3 The OA1 dummy oscillator is provided to complete the heater string of the "OA1" Repeater.

1.4 This circuit provides carrier frequencies for group modulators of ON carrier junction.

1.5 This circuit provides a carrier frequency for use as a level control in the ON carrier junction and the ON carrier common terminal.

2. WORKING LIMITS

2.1 None

3. FUNCTIONS

3.1 The OB1, OC1 and OD1 repeater oscillator (options B, E and F) supply 116, 196 and 276 kc carrier frequencies at about 0.55 volts to two repeater amplifiers for the frequency "frogging" modulation process in the OB1, OC1 and OD1 repeaters.

3.2 The OA1 loop test oscillator (option A) supplies a 38 kc carrier frequency at approximately 1.2 volts to the O1 loop-test unit.

3.3 The ON junction oscillators (Options F, G, H, J, K) supply 236, 256, 276, 296 and 316 kc frequencies at approximately 0.55 volts to group modulators located in modified group transmitting and group receiving ckts. in the ON carrier junction.

3.4 The ON level control oscillator (Option M) supplies a 76 kc carrier frequency to the ON junction and to the ON terminal combining networks for the purpose of loading the following ON Repeaters to the normal level.

3.5 The OA1 dummy oscillator completes the heater circuit for the OA1 repeater.

3.6 Means are provided for making output voltage tests at pin jack (OUT).

4. CONNECTING CIRCUITS

4.1 Application Schematic, O1 Carrier Repeater - SD-95155-01.

4.2 OB1, OC1, OD1 Group Receiving or Repeater Amplifier Ckt. and ON1 Group Receiving Ckt. - SD-95152-01.

4.3 Loop Test Ckt. - SD-95184-01.

4.4 ON Carrier Telephone - Application Schematic for ON1 Junction - Group 1 - SD-95196-01.

4.5 ON Carrier Telephone - Application Schematic for ON1 Junction - Groups 2 and 3 or Groups 4 and 5 - SD-95197-01.

4.6 ON Carrier Telephone - ON1 Combining Network and Oscillator Circuit - SD-95198-01.

DESCRIPTION OF OPERATION

5. GENERAL

5.1 The oscillating circuit (Fig. 1) utilizes the grid, screen and cathode of tube (V1) as a crystal controlled triode

oscillator. The screen grid of tube (V1) is coupled back to the control grid through condenser (C2) and crystal (Y1). The resistance (R1) and condenser (C1), in parallel, together with condenser (C2), provide voltage division determining the amount of feedback to the control grid. Condenser (C2) acts to provide a frequency adjustment of about +20 to -12 cycles per second, in the OB1, OC1 and OD1 Repeater Oscillators or ±5 cycles per second in the OA1 Loop Test Oscillator and proportional amounts at the other frequencies.

Resistance (R2) acts to prevent high frequency oscillations. The output of the oscillator is delivered from the plate of the tube (essentially electron coupled to the control grid-screen grid-cathode "triode" oscillator) to the high impedance winding of the output transformer (T1) which is tuned to the oscillator frequency by condenser (C6) to provide about 25 db second harmonic discrimination. The oscillator output is fed from the secondary of output transformer (T1) through series resistor (R6) to terminals A and B of (P1) plug, except for the OA1 Loop Test Oscillator, where resistor (R6) is strapped out of the circuit to provide greater output.

5.2 The (P1) plug mates with the (J1) jack on the repeater mounting frame and the output of the oscillator subsequently is applied through the midpoints of four repeating coils to the two modulators associated with the E-w and W-E repeater amplifier units. It also mates with the associated jack on the loop-test unit and is applied directly to the modulator in that unit. In the ON junction oscillator the output is applied to the group modulator of the group transmitting and group receiving circuits in parallel. The level control oscillators connect to a variable loss and the straight through transmission circuit.

5.3 The plate power is applied through terminal H of Plug (P1) and resistance (R5) with condenser (C5) filtering and acting as the by-pass to cathode from the primary of the output transformer. Screen grid power is obtained from the plate supply and is applied through resistances (R4) and (R3) with condenser (C4) filtering. Condenser (C3) provides from screen to cathode a negative load reactance to meet the requirements of the Pierce type circuit. About four volts are developed across this condenser. The cathode is grounded.

5.4 Testing of the oscillator tube for the OB1, OC1, and OD1 Repeater Oscillators, for ON junction oscillators and for level control oscillators is accomplished by reading the output voltage at the pin jack (OUT) with a vacuum tube voltmeter (about 0.55 volt) before and after the heater voltage has been reduced about 20% from its normal value by a push-button resistance arrangement which is a part of the mounting. No provisions are made for testing the tube of the OA1 Loop-Test Oscillator. However, when in operation, the oscillator works into a varistor type modulator and should supply a minimum of 0.8 volts as read with a vacuum tube voltmeter at the pin jack (OUT). This voltage may go as high as 1.5 volts.

5.5 The nominal 20 volt heater supply for the OB1, OC1 and OD1 Repeater Oscillator is obtained from series parallel operation with the tubes in the associated repeater and is applied through terminals D and F of plug (P1). For the OA1 Loop-Test Oscillator it is obtained from the channel unit jack through a series dropping resistor located in the loop-test unit and applied through terminals D and F of plug (P1). In the case of ON junction oscillators and ON level control oscillators the 20-volt heater of this panel is connected in series with another 20-volt heater located in the ON junction or ON terminal combining network.

5.6 The OA1 Dummy Repeater Oscillator (Fig. 2) is a plug-in unit which mounts on a repeater frame and is used to complete the heater circuit of the OA1 repeater.

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DEPT. 2230-RAH-WAD:SW