

COMMON SYSTEMS  
REPEATER CIRCUIT  
ARRANGED FOR OPERATION ON  
48 VOLT FILAMENT SUPPLY  
FOR USE AT TERMINATING OFFICE  
WITH ANNOUNCEMENT DESK NO. 1 OR 1B

1. PURPOSE OF CIRCUIT

1.1 This one-way telephone repeater circuit is for use at a terminating station in a 48 volt central office in connection with announcement service from a central bureau.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 Provides for amplifying voice currents, without appreciable distortion, between frequencies of 200 and 3000 cycles.

3.2 Provides filament and space current for the vacuum tubes.

3.3 Provides means for measuring and automatically regulating the filament current through the tubes.

3.4 Provides means for varying the transmission gain of the repeater.

3.5 Provides means for equalization of the transmission loss in the associated trunks over the frequency range.

3.6 Provides, in connection with the associated alarm circuit, for giving a signal in case of failure in the filament and plate circuits.

3.7 Provides jacks and a key for use in testing the repeater.

3.8 Provides means for monitoring on the output of the repeater.

3.9 Provides means in connection with the associated incoming distributing and alarm circuit for testing the filament activity of the vacuum tubes while the repeater is in service.

4. CONNECTING CIRCUITS

When this circuit is listed on a keysheet the connecting information thereon is to be followed.

4.1 SD-95459-01 - Announcement Supply Incoming Distributing and Alarm Circuit for Terminating Office.

DESCRIPTION OF OPERATION

5. GENERAL

This repeater consists essentially of a one-way two-stage amplifier and is provided for adjusting transmission gains, as measured between 600 ohms, up to approximately 27 db to within approximately 1/2 db of the desired gain. Taps on the secondary side of the (T1) input transformer permit gain adjustments in steps of 4.7 db each, while each step of the switch on the (T2) input transformer gives a gain adjustment of 0.95 db. Tuning arrangements are also provided making it possible to adjust the gain-frequency characteristic of the repeater as required for the type of circuit on which it is to be used.

6. OPERATION IN CONNECTION WITH ASSOCIATED CIRCUITS

When this repeater is operated by its associated circuit the "B" and "F-" leads are connected together. The closing of these leads causes current to flow through the filaments of the (1) and (2) vacuum tubes in series with the (FIL. CONT.) ballast lamp. The (FIL. CONT.) ballast lamp is for the purpose of automatically regulating the amount of current through the filaments. After the filament circuit is closed it requires an appreciable time interval for the space current to build up sufficiently to operate the (P) relay which removes ground from the "A" lead. The removal of ground from this lead opens the associated slow operating alarm circuit. In case either the filament circuit of both tubes or the plate circuit of the (2) tube fails the (P) relay releases, thus causing the associated alarm circuit to function and light the (FIL. ALM.) lamp.

7. FILAMENT CIRCUIT

The filament circuit current when measured by inserting the meter plug of Fig. 2 into jack (F) should be between .490 and .530 ampere. Note that this complete current does not pass through the filament circuits as tube 1 is shunted

↑  
Reduce to 7 1/2" - 1 1/2" all in same format  
↓

by resistance M and tube 2 is shunted by resistances D and N.

#### 8. FILAMENT ACTIVITY TEST

The filament activity tests of the (1) and (2) vacuum tubes are made in conjunction with the connecting incoming distributing and alarm circuit. The method used in testing is measuring the transmission level of the output of the repeater for two values of filament current through each of the two vacuum tubes during the 800 cycle tone period by operating the (M) key in the connecting circuit. The operation of this key connects the associated meter across the output of the repeater, causing the meter to give a deflection. With a call waiting condition at the announcement bureau, the 800 cycle tone is connected to the system once every 15 seconds for a period of approximately 0.5 second. The maintenance man monitoring on the circuit after providing a call waiting condition will operate the (M) key as soon as the operator stops speaking and release it after the tone period.

The two values of filament current are the normal value and approximately 6% less than normal. The change in filament current of the (1) and (2) tubes is obtained by operating the (TST1) and (TST2) keys respectively. If the change in level as indicated on the meter, with the 6% reduction in filament current, is

greater than a specified value the tube under test is replaced. After the test the keys should be in their normal position.

#### 9. GRID BIAS

The circuit is arranged so that there is a negative bias of approximately 8 volts on the grid of the (2) tube, and approximately 1-1/2 volts on the grid of the (1) tube.

#### 10. TESTING

The filament circuit may be closed by operating the (F) key when the repeater is disconnected from its associated circuit and when it is desired to test the circuit. Under this condition the input and output jacks should be used for testing purposes.

#### 11. OUTPUT CIRCUIT

In order to permit the bridging of a number of circuits simultaneously to the output of the repeater the (T3) output transformer provides a secondary winding having low impedance so as to care for the bridging arrangement without objectionable cross-talk between subscribers.

#### 12. MONITORING

When it is desired to monitor on the circuit this may be done by inserting the plug of Fig. 3 into the (MON) jack.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-HGWB-FS-GD

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REPEATER CIRCUIT  
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WITH ANNOUNCEMENT DESK NO. 1 OR 1B

CHANGES

B. CHANGES IN APPARATUS

B.1 Removed	Replaced By
W2K Cord	W2BC Cord
R2AC Cord	R2CF Cord

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The designation (IN) is removed from  
lead going from (G) resistance to 7A  
Ballast Lamp.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-AHL-RLL-BZ

TO BE USED AS AN ORIGINAL  
BY THE HAWTHORNE PRINT SHOP

COMMON SYSTEMS  
REPEATER CIRCUIT  
ARRANGED FOR OPERATION ON  
48 VOLT FILAMENT SUPPLY  
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CHANGES

B. CHANGES IN APPARATUS

B.1 Superseded                      Superseded By

83A Retard. Coil    274J Retard. Coil  
"Z" Option                      "Y" Option

for use in this circuit and superseded by the 274J retardation coil designated "Y" option. Prior to issue 3-D "Z" option was not designated and "Y" option was not shown.

D.2 Circuit note 103 was added.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The 83A retardation coil designated "Z" option was rated "Mfr. Disc."

D.3 The "options used" table was added. All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-SRM-RLL-CD

TO BE USED AS AN ORIGINAL  
BY THE HAWTHORNE PRINT SHOP

COMMON SYSTEMS  
REPEATER CIRCUIT  
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48 VOLT FILAMENT SUPPLY  
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CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

The rating is changed from AT&TCo.  
Standard to A&M only, as all announcement  
desk circuits No. 1 and 1B are rated  
A&M only.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-BP-RLL-CM

TO BE REPRODUCED AS AN ORIGINAL  
BY THE HAWTHORNE PRINT SHOP

COMMON SYSTEMS  
REPEATER CIRCUIT  
ARRANGED FOR OPERATION ON  
48 VOLT FILAMENT SUPPLY  
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WITH ANNOUNCEMENT DESK NO. 1 OR 1B

CHANGES

B. CHANGES IN APPARATUS

Superseded	Superseded By
208M input trans. "X" opt.	240A input trans. "W" opt.
212C input trans. "V" opt.	634B input trans. "U" opt.
12B lamp, "T" opt.	13B lamp, "S" opt.
Model 280 Weston MA, "R" opt.	Model 281 Weston MA, "Q" opt.
Sprague type 10K ) or Ohmite ) 10-watt ) Brown Devil ) resistor, ) "N" opt. )	KS-8512, L3B resistor, "M" opt.
Removed	Replaced By
716D receiver	(723A receiver (15A headband

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The "Mfr. Disc." 208M and 212C input transformers are superseded by the 240A and 634B input transformers respectively.

D.2 The use of the 12B lamp is rated "A&M Only" and superseded by the 13B lamp.

D.3 The use of the Model 280 Weston milliammeter is rated "Mfr. Disc." and is superseded by the Model 281 Weston milliammeter.

D.4 The use of the Sprague type 10K and Ohmite 10-watt Brown Devil resistors is rated "Mfr. Disc." and superseded by the KS-8512, L3B, resistor equipped with 241 terminals.

D.5 The 716D receiver is removed and replaced by the 723A receiver and a 15A headband.

D.6 Options "X", "W", "V", "U", "T", "S", "R", "Q", "N" and "M" are added to Note 103 and to the options used table.

D.7 Note 303 is added.

D.8 Note 301 is modified. The last sentence, "These connections need not be made part of the office record," is added.

All other headings no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2325-JFM-EWO-MC

200791

COMMON SYSTEMS  
REPEATER CIRCUIT  
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WITH ANNOUNCEMENT DESK NO. 1 OR 1B

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Cross-connection Figs. 51 and 52 are rated "Mfr. Disc." and Fig. 53 is added to cover changes in connection with a new equipment unit J95403AF (-).

D.2 J95403AF (-) is added to the equipment information.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2325-RDN-EWO-EL