COMMON SYSTEMS
TRANSMISSION MEASURING
MILLIWATT DISTRIBUTING CKT
USING 2A SENDING PANEL

CHANGES

B. CHANGES IN APPARATUS

B.1 Added (optional)

In Fig. 3

1 Res (T3) KS16311,L1 2110Ω
1 Res (R3) KS16311,L1 2110Ω

In Fig. 4

1 Res (T4) KS16311,L1 511Ω
1 Res (R4) KS16311,L1 511Ω

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 In Figure 3 "MM" option and in Figure 4 "NN" option were added to cover B.1 above to provide adjustable outlets for calibration of the measuring equipment.

D.2 Figure 1 was rated "Mfr. Disc.", and also revised to show the 111 type resistors lined out as they are now "Mfr. Disc.", and replaced by 227 type resistors.

D.3 Note 217 was added and note 207 was clarified.

D.4 Notes 102 and 104 were revised to cover D.1 above. The last two circuits were added to note 104.

D.5 Figure 103 was revised to clarify connections to Figure 2.

D.6 Cad 4, 5 and 6 were also revised to clarify connections to Figure 2.

D.7 The rating of the drawing was changed from "AT&TCo Standard", to "A & M only" and the replacement note "Replaced By SD-95277-01", was added.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2137-PFJ-BCB-AM

COMMON SYSTEMS TRANSMISSION MEASURING MILLIWATT DISTRIBUTION CKT USING 2A SENDING PANEL

SECTION I - GENERAL DESCRIPTION

1. GENERAL

1.1 This circuit is used to supply 1000 cycle testing power to a number of test outlets as required. Each outlet provides a known output of not more than 1 milliwatt for use with transmission measuring circuits and transmission test line circuits.

1.2 Outlets are supplied from groups of 5 distributing networks arranged for either 600 ohm or 900 ohm office impedance. Each outlet includes means for an adjustment to the specified output power to a terminating resistor, and thereby compensate for a small amount of office wiring equipment or pad deviation loss.

1.3 The 1000 cycle generator is powered by the office 60 cycle supply, and normally is turned-on only when needed. A lead from the central office battery supply is also required to operate a power supply relay.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

1.1 The milliwatt distribution circuit is illustrated by Fig. 101, showing the general relation of the generator circuit of Fig. 1, the distributing network circuits Figs. 3 and 4, and typical connecting circuits, outlets or loads.

2. SPECIFIC

2.1 Operation

2.11 The 60 cycle power supply is connected as controlled by the connection of any start lead (ST) to an available frame ground, and about three seconds is required to obtain a stable output power and frequency of 1000 cycles. The generator is a single frequency inductor-alternator type, mounted in a separate housing, attached to the drive motor. The motor is of the single-phase permanent-split capacitor type, and the alternator is of the permanent magnet type. The rated full load speed is 3530 rpm for 60 cycles.

2.12 Figure 1 shows the generator load circuit which includes a third harmonic suppression network and a step down transformer together with a low reistance load circuit. This low resistance load circuit is comprised of a number of shunt resistors, an adjustable shunt for temperature compensation for output change, and all of distributing networks with their terminations. The magnitude of this low resistance load circuit for the generator is less than eight ohms. A 1200 ohm resistor is equivalent to an outlet, and the net value of load resistance depends upon the generator. It is not a fixed value. The adjusted 1000 cycle voltage across this load circuit is that value which supplies one milliwatt in the terminating reference meter connected to Fig. 2, and is approximately 1.55 volts.

2.13 This adjustment depends upon the number of load circuits being used and should be in accordance with BSP section (E40.373.02). Since this adjusted voltage is applied to all of the distributing networks of Fig. 4, and the 1:1.5 step-up ratio repeating coil of Fig. 3, each individual connecting circuit, (test line etc.) will also receive one milliwatt.

2.14 The distributing networks provide a number of series resistors which may be strapped out to increase the power at the reference meter to a precise value when a loss occurs in the office wiring and equipment preceding the reference meter. This network strapping introduces a slight penalty in the impedance of the sending source. The smallest adjustable step is 2.5 ohms in each lead which results in .036 db change in a 600 test line, or .024 db change in a 900 ohm test line. As stated in Note 302 the adjustment of these resistors in the telephone plant is controlled by BSP section A204.474.00 (E30.223.00)

2.2 Distribution Circuits

2.21 As shown in Fig. 103, repeating coils are provided in groups of five and networks in groups of five, with the additional provision of one 600 ohm maintenance outlet per Figure 2 for each 2A panel.

2.22 Provision has been made for up to 50 outlets from a single 2A panel, some arranged as 600 ohm types per Fig. 4, and some as 900 ohm types per Fig. 3.

2.23 No provision has been made for blocking dc from the generator. Separate

blocking arrangements should be provided in the connecting circuit in offices where dc voltages are present on the circuits to be tested. The generator and output circuit will not be damaged by 48 volts but such connections should be avoided.

2.24 Each connecting circuit should be balanced with respect to ground and provided with a terminating resistor of a matching impedance value when not connected to a circuit under test.

2.3 Adjustable temperature compensation

2.31 The temperature compensation coil, which is part of the load circuit, is a temperature sensitive resistor of a value suitable for effectively decreasing the dummy load by an amount that cancels the normal decrease in output resulting from a warm-up of the generator. The amount of compensation can be decreased by means of resistors connected in series with the temperature compensating coil. The actual setting should be determined under field operating conditions and as described in BSP section E40.373.01. The adjustable range is from 0 ohms to 6 ohms in one ohm steps.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.1 Output

1.11 Fifty distributing networks served from a single 2A Panel have been shown on this drawing.

1.12 Maximum adjustment of output for office wiring and equipment losses is approximately 0.5 db.

1.2 Supply voltages

1.21 60 cycles, 105-125 volts

1.22 SIG battery 21-26 volts or 20-28 volts and 45-50 volts or 40-56 volts.

1.3 Current drain

1.31 60 cycle - 0.3 amp

1.32 24VSIG - -87-MA or 48VSIG - -42-MA

2. FUNCTIONS

2.1 Provide a stabilized 1000 cycle sine wave output of 0 dbm for transmission tests.

2.2 Provide up to 50 outlets at either 600 ohms or 900 ohms, or in combinations and each outlet adjustable for a range of about 0.5 db in order to compensate for office wiring and equipment or pad deviation loss.

2.3 Provide for operation from 60 cycle supply and with means for turning off automatically when not needed for test.

3. CONNECTING CIRCUITS

3.1 Only connecting circuits which meet the requirements of 3.2 shall be connected to any outlet per Fig. 3 or Fig. 4.

3.2 Connecting circuits shall be balanced with respect to ground. They shall not be subject to sustained shorts or opens or improper loads. Multipled appearances shall be avoided. Sources of dc current shall be blocked from the milliwatt supply circuit.

3.3 Circuits in the following list are connecting circuits.

3.301 SD-59432-01 TRANS MEAS CKT (VF CHAN PATCH BAYS)

3.302 SD-59433-01 NOISE MEAS CKT (VF CHAN PATCH BAYS)

3.303 SD-59972-01 MAINTENANCE CKT (TASI)

3.304 SD 68095-01 TEST LINE CKT (4W INTERTOLL)

3.305 SD-68446-01 AUTOMATIC TMS

3.306 SD-95017-01 SENDING PAD CKT

3.307 SD-95101-01 SENDING JACK CKT

3.308 SD-95135-01 TRANS MEAS CKT (TEST-BOARDS)

3.309 SD-95136-01 NOISE MEAS CKT (TEST-BOARDS)

3.310 SD-95147-01 SENDING PAD CKT

3.311 SD-95162-01 REP MEAS CKT (V1 & V3)

3.312 SD-95698-01 T&N CHECKING CKT (CAL)

3.313 SD-96000-01 TEST LINE CKTS

3.314 SD-98100-01 TEST LINE CKTS

3.315 SD-95900-01 TRANS & NOISE MEAS CKT (TESTBOARDS)

3.316 SD-96519-01 SF SIGNALING TEST CKT

3.317 SD-95608-01 ANNOUNCEMENT SYSTEM