

806D POWER PLANTS
20-CYCLE MACHINE RINGING EQUIPMENT
KS-5546 RINGING MACHINES
72 TO 88 VOLTS, 0.25 AMPERE
75 TO 110 VOLTS, 0.5 AMPERE
84 TO 88 VOLTS, 0.5 AMPERE
EQUIPMENT DESIGN REQUIREMENTS
POWER SYSTEMS

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and circuits to be used in the manufacture and installation of 806D ringing power plants, which are ordinarily used in No. 11 manual, No. 1 step-by-step, 350A, 355A, and 35E97 dial offices, and in large 701B and 711B PBXs.

1.02 This specification is reissued:

- (a) To add 1.14.
- (b) To add "E8 or E9" in Table A on the line with "No. 701B or 711B PBX", and under the column "Eqpt To Be Added".
- (c) To add J86596E, List 8 and List 9.
- (d) To add notes E and F under J86596E.

Capacities and Salient Features

1.03 Tables A and B outline the coded units available, giving their capacities, voltage ranges, and equipment units. This specification does not list equipment for No. 360A dial offices, which are "A&M Only". However, for these offices, where it is desired to replace an existing ringing plant, the J86596E code as used for 701B and 711B PBXs may be furnished, except that SD-80886-01, Fig. 15 should be used instead of Fig. 4. Furnish J86727F surge-absorbing equipment for machine ringing brushes. If howler is required, furnish J86596D, List 1 in addition to the J86596E equipment.

Description

1.04 These plants are arranged to provide ringing current, tones, and signals for No. 11 manual, No. 1 step-by-step, 350A, 355A, and 35E97 dial offices, and for 701B and 711B PBXs. Two panel-mounted converter-type ringing machines per KS-5546 are provided and arranged so that upon the failure of the regular machine, the load will be automatically transferred to the reserve

machine and an alarm given. Both regular and reserve machines operate from the central office battery. In addition to 20-cycle ringing, the KS-5546 machine provides low and high tones by means of drum-type interrupters, 30-, 60-, and 120-ipm interrupted ground, and machine ringing at regular central office intervals. Provision is also made for supplying the low and high tones in No. 355A dial and No. 11 manual offices from static frequency generators with automatic transfer to the drum-type interrupters in case of power failure. The machines are arranged to start under control of the telephone switching equipment in 701B and 711B dial PBXs and No. 355A and 35E97 dial offices and to run continuously in No. 11 manual, No. 1 step-by-step, and No. 350A dial offices.

1.05 These plants are arranged to provide LT5 or LT6, 60 ipm for line-busy tone and LT1 120 ipm for paths-busy tone. If connector shelves are not arranged for prevention of talking over busy tone, LT1 60 ipm or LT4 60 ipm may be provided on an "A&M Only" basis for line-busy tone.

1.06 In No. 355A dial offices, J86596A, List 4 provides five D-type codes plus reverting ringing and 4- or 8-party superimposed ringing. Three-brush distribution of ring 1 and one-brush distribution of ring 2 are provided for ac-dc ringing and 4-brush distribution of ring 1 only (two Sup+ and two Sup-) for superimposed ringing. Without a voltage regulator the rating of these machines is 0.5 ampere, 75 to 110 volts. With the voltage regulator, which shall be furnished with all superimposed ringing plants and may be added to existing superimposed ringing plants, the rating of these machines is 0.5 ampere, 84 to 88 volts. This equipment provides continuous low tone for use when 30-ipm tone and flash are required.

1.07 In No. 1 step-by-step and No. 350A dial offices, J86596A, List 4 provides five D-type codes plus reverting ringing and 4- or 8-party superimposed ringing. Three-brush distribution of ring 1 and one-brush distribution of ring 2 are provided for ac-dc ringing and 4-brush distribution

of ring 1 only (two Sup+ and two Sup-) for superimposed ringing. J86596A, List 5 provides 3-brush distribution of ring 1 and one-brush distribution of ring 2 for ac-dc ringing and 6-brush distribution of ring 1 only (three Sup+ and three Sup-) for superimposed ringing but does not include any side or reverting ringing. Without a voltage regulator, the rating of these machines is 0.25 ampere, 72 to 88 volts, and with a voltage regulator, 0.5 ampere, 84 to 88 volts. The voltage regulator shall be furnished in all cases for No. 1 step-by-step, and for No. 350A dial; it shall be furnished in all superimposed ringing plants and may be furnished in ac-dc plants to increase the capacity to 0.5 ampere. The voltage regulator may also be added in existing plants. This equipment provides continuous low tone and 30-ipm BR1 (long pulse) for use with through toll and customer dialing.

1.08 In No. 11 manual offices, the J86596C, List 5 machines provide 3-brush distribution of ring 1 and one-brush distribution of ring 2 for either ac-dc or superimposed ringing. The rating is 0.25 ampere, 72 to 88 volts without a voltage regulator. With a voltage regulator, the rating is 0.5 ampere, 84 to 88 volts. The voltage regulator shall be furnished in all superimposed ringing plants and may be furnished in ac-dc plants to increase the capacity to 0.5 ampere. The voltage regulator may also be added in existing plants. This equipment provides 30-ipm BR1 (long pulse).

1.09 In 701B and 711B PBXs, the J86596A, List 5 machine is used for 0.5-ampere capacity. This equipment may also be used in 701A and 711A PBXs (A&M Only). For a plant of 0.25-ampere capacity, the 806G plant per J86472 is recommended.

1.10 In No. 35E97 offices, J86596A, List 3 provides five A-type codes plus reverting ringing and 4- or 8-party superimposed ringing. Three-brush distribution of ring 1 and one-brush distribution of ring 2 are provided for ac-dc ringing and 2-brush distribution of ring 1 only (one Sup+ and one Sup-) for superimposed ringing. One-busy tones are 60 ipm and paths-busy tones 120 ipm.

1.11 The ringing machines and their associated equipment are assembled on 23-inch mounting plates suitable for mounting on either relay rack framework or power-board framework and, if full equipment is provided, occupy a space of thirty-five 1-3/4 inch mounting plates. Various types of framework available are listed in Part 3. All alarms for the ringing plant are mounted with the ringing equipment in accordance with the latest practices.

1.12 The additional battery equipment required in connection with 4- or 8-party superimposed ringing is covered in J86212.

1.13 Surge-absorbing equipment per J86727F shall be furnished for all plants except when used for 701B or 711B PBX.

1.14 In 701B and 711B PBXs, TOUCH-TONE dial tone is provided by J86596E, List 8, serving under 200 lines, and by J86596E, List 9, with automatic transfer serving between 200 and 4000 lines. This equipment may also be used in 701A and 711A PBXs (A&M Only).

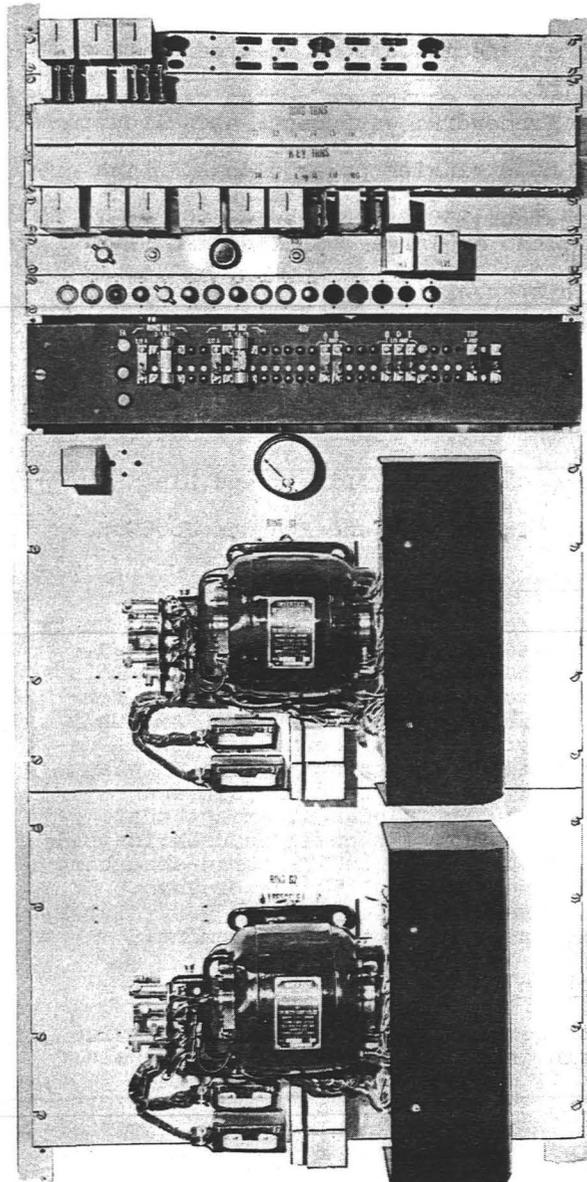


Fig. 1 - J86596E Ringing Power Plant in 701-type PBX

Table A - Ringing Supplies

Type of Office	Type of Ringing Machine	AC Ringing		Common Eqpt	Eqpt To Be Added	See Notes
		Amp	Volts			
No. 355A Dial	5 code Plus Reverting and 4-party AC-DC	0.5	{ 75-110 and 90-130	B1	{ 2-A4 B2 or B3 B5 and B6 B17 or B18, B20	A, B, C, E, G
	5 code Plus Reverting, 4-and 8-party (Sup Ring Only With Voltage Regulator)	0.5	{ 84-88 and 110-130	B16	{ 2-A4 B2 or B3 B6 B17 or B18, B20	A, B, C, E, G, H
No. 35E97	5 code Plus Reverting, 4-and 8-party	0.5	{ 75-110 and 90-130	F2	{ 2-A3 F3	A, C, E
No. 350A Dial	AC-DC Plus 5 code, Reverting 4-and 8-party (Without Voltage Regulator)	0.25	72-88	B1	{ 2-A4 B2 or B3 B5, B6 B19, B20	A, B, C, E, F, G I
	2- or 4-party AC-DC (Without Voltage Regulator)	0.25	72-88	B1	{ 2-A5 B2 or B3 B5, B19, B20	A, B, C, E, F, G I
No. 1, Step by Step or 350A Dial	AC-DC or Sup Plus 5 code, Reverting 4-and 8-party (With Voltage Regulator)	0.5	84-88	B16	{ 2-A4 B2 or B3 B6, B19, B20	A, B, C, E, G, I
	2- or 4-party AC-DC or 4-party Sup (With Voltage Regulator)	0.5	84-88	B16	{ 2-A5 B2 or B3 B19, B20	A, B, C, E, G, I
No. 701B or 711B PBX	AC-DC	0.5	65-90	E5	{ 2-A5 E6, E7, E8 or E9	K
Machine Ringing No. 11 Manual	AC-DC or Sup (Without Voltage Regulator)	0.25	72-88	C2	2-C5	A, C, D, E, G, H, J
	AC-DC or Sup (With Voltage Regulator)	0.5	84-88	C4	2-C5	A, C, D, E, G, J

Notes for Table A

When 4-party selective superimposed ringing or 8-party semiselective superimposed ringing lines are involved, additional dry battery equipment should be specified as follows.

Tube Type { J86212W, List 1, 2,
(AT&TCo Std) { or 5
 { J86212W, Lists 3, 9,
Subsets { and 10

This equipment furnishes 40-volt superimposing battery and 48-volt tripping battery.

Relay Type (A&M Only) { J86212W, List 1, 2,
 { or 5
 { J86212W, List 6 or 7
Subsets { J86212W, List 9 and 10

This equipment furnishes 40-volt superimposing battery and 75-volt tripping battery.

1. J86212W, List 1 is for use with a 105D power plant or other similar power cabinet, 18 inches deep. Furnish list 2 or 5 for relay rack mounting or framework arranged for 1-foot 0-inch guardrails.

Notes for Table A (Cont.)

- B. Furnish howler supply, as required, as covered in Table B.
- C. When coin control supply is required, additional equipment per J86212F should be specified.
- D. When static-tone generator supply with drum interrupter reserve is required, additional equipment per J86596C, List 3 should be specified.
- E. These ringing supplies are not suitable for providing 20 cycles for 1000-cycle signal supply circuits which require frequency limits of 18-1/3 to 20 cycles.
- F. Furnish B16 instead of B1 and B5 in No. 350A dial offices with ac-dc ringing when it is desired to increase the ringing machine capacity from 0.25 to 0.5 ampere.
- G. Furnish surge-absorbing equipment per J86727F.
- H. Furnish C4 instead of C2 in No. 11 manual offices with ac-dc ringing when it is desired to increase the ringing machine capacity from 0.25 to 0.5 ampere.
- I. If voltage regulator is added in existing offices, change from "ZJ" to "ZK" options on ringing circuit and furnish "ZL" or "ZM" option, as required.
- J. If voltage regulator is added in existing offices, change from "P" to "N" options on ringing circuit and furnish "K" or "J" option, as required.
- K. Furnish E6 when 120-ipm paths-busy tone is required.

Table B - Supplementary Tone Supplies

Type of Office	Description	Max Calls	Equip
No. 1 Step by Step, 350A, or 355A Dial	Howler Supply	See Note A	D1

Note

- A. The howler supply will furnish howler for four positions of test desk or one "A" switchboard.

2. SUPPLEMENTARY INFORMATION

- 802-000-000 - Power Systems Index
 AA128.002 - List of Equipment Design Requirements
 AA128.006 - List of General Equipment Requirements Sections
 167-255-301 - Maintenance Instructions

- J86212 (802-029-150) - Small Ringing Equipments
 J86294 (802-029-160) - Ringing Demand Meter
 J86727 (802-029-152) - Small Ringing Equipment
 J86734 (802-004-152) - Ringing Generator Calculations
 Floor Plan Data Book
 Power Data Book

3. DRAWINGS

WECO J drawings listed should be ordered by referring to the prefix and base number and requesting the current dash (-) number.

Circuits

- SD-80884-01 - Ringing Circuit - Generator and Interrupter Equipment - SxS No. 1, 350A, 355A, and 35E97 Dial Offices and 701B and 711B PBXs
 SD-80885-01 - Ringing Circuit - Distributing and Control Equipment - SxS No. 1, 350A, 355A, and 35E97 Dial Offices and 701B and 711B PBXs
 SD-80886-01 - Signaling Circuit - Tone Supply with Static Frequency Generators and Drum Interrupters
 SD-80893-01 - AC Alarm Circuit
 SD-80895-01 - Ringing Circuit - AC-DC or Superimposed Machine Ringing - No. 11 Manual Systems
 SD-81277-01 - Regulator Circuit - Voltage - Contact Type - For Use With KS-5133, KS-5510, and KS-5546 Ringing Machines
 SD-81278-01 - Ringing Circuit - For Absorbing Surges on Machine Ringing Brushes
 SD-81387-01 - Ringing Demand Meter Circuit
 SD-81719-01 - Signaling Circuit, Dial Tone Generator, For PBX, "TOUCH-TONE" Calling

Equipment

- J86596A-() - Ringing Machine Equipment for SxS No. 1, 350A, 355A, and 35E97 Dial Offices and 701B and 711B PBXs
 J86596B-() - Ringing Equipment for SxS No. 1, and 350A, and 355A Dial Offices
 J86596C-() - Ringing Equipment for No. 11 Manual Offices
 J86596D-() - Howler Supply for SxS No. 1, 350A, and 355A Dial Offices
 J86596E-() - Ringing Equipment for 701B and 711B PBXs Using KS-5546, List 15 (0.5 Ampere) Ringing Machine
 J86596F-() - Ringing Equipment for 35E97 Dial Offices

- Ringing Machine Equipment - SxS No. 1, 350A, 355A, and 35E97 Dial Offices - and 701B and 711B PBXs
- Ringing Equipment - SxS No. 1 and 350A Dial Offices
- Ringing Equipment - 355A Dial Offices
- Ringing Equipment - 35E97 Dial Offices
- Ringing Power Board Assembly - 701B and 711B PBXs
- Ringing Power Board Assembly - 35E97 Dial Offices
- Ringing Power Board Assembly - SxS No. 1, 350A, and 355A Dial Offices

d Miscellaneous

- Power Board Mounting Framework - Box Type For Mounting 1-3/4 Inch Plates
- Fuse Board - Miscellaneous Details
- Relay Rack Assemblies - Floor-supported Type
- Relay Rack Unit Assembly - 181-type Terminal Strips
- Fuse Panels
- Relay Rack Assemblies - Channel Uprights
- Relay Rack Cable Brackets

Co Std) - Ringing Machine
ment for Step-by-Step No. 1,
355A, and 35E97 Dial Offices
01B and 711B PBXs

36596A-()

only) - Assembly, wiring, and
ment for 5-code (A type)
546, List 11 ringing machine
line, plugs, and mounting de-
s) per SD-80884-01, Fig. 1 with
"N", and "R" options for
350A and 355A offices. (See
A)

ably, wiring, and equipment for
e (A type) KS-5546, List 11
ng machine (machine, plugs,
ounting details) per
884-01, Fig. 1 with "W", "M",
Q" options for No. 35E97
es. (See note A.)

ably, wiring, and equipment for
e (D type) KS-5546, List 14
ng machine (machine, plugs,

and mounting details) per
SD-80884-01, Fig. 3 with "W" option
for step-by-step No. 1, 350A, and
355A offices. (See note A.)

List 5 - Assembly, wiring, and equipment
for KS-5546, List 15 (no codes)
ringing machine (machine, plugs,
and mounting details) per
SD-80884-01, Fig. 4 with "W"
option for step-by-step No. 1 and
350A offices and 701B and 711B
PBXs. (See notes A and B.)

Notes

- A. When 4-party selective superimposed ringing is furnished, "W" wiring shall be disconnected at the plug and replaced by "Z" wiring.
- B. This equipment may also be furnished for 701A and 711A PBXs (A&M Only) on a job-engineered basis.

J86596B (AT&TCo Std) - Ringing Equipment
for Step-by-step No. 1, 350A, and
355A Dial Offices

Equipment - J86596B-()

List 1 - Assembly, wiring, and common equip-
ment without voltage regulator.

See
Wire Equip Notes

Ringing Ckt, SD-80885-01: Fig. 1, "JJ", "KK", "ZC", and "ZJ" Options	1	1	A,B,D, E,J,K,
Fig. 1A or 1B	1	1	
Fig. 2, "J" and "JC" Options	1	1	
Fig. 8, "J" Option	1	1	
Alarm Ckt, SD-80893-01, Fig. 1	1	1	

List 2 - Wiring and equipment per
SD-80885-01, Fig. 6 required in
addition to list 1 or 16 for pro-
viding automatic and key transfer.

List 3 - Wiring and equipment per
SD-80885-01, Fig. 7 with "ZC"
option, and Fig. 7A, required in
addition to list 1 or 16 for pro-
viding automatic and dialing
transfer.

List 5 - Wiring and equipment per SD-80885-01,
Fig. 9 and 11 with "ZC" and "ZJ"
options, required in addition to
list 1 for providing auxiliary
start and transformer equipment
for KS-5546, List 14 or 15 ringing
machines per J86596A, List 4 or 5.

List 6 - Wiring and equipment per SD-80885-01, Fig. 3 with "N" and "ZC" options, and Fig. 4 and 4B, required in addition to list 1 or 16 for auxiliary transfer equipment when KS-5546, List 14 ringing machines per J86596A, List 4 are furnished.

List 16 - Assembly, wiring, and common equipment, including auxiliary start and transformer equipment and voltage regulator for 1/2-ampere ringing machines.

	Wire	Equip	See Notes
Ringing Ckt, SD-80885-01: Fig. 1, "JJ," "KK," "ZC," and "ZK" Options	1	1	A,B,D, E,F,I, J,K
Fig. 1A or 1B	1	1	
Fig. 2, "J" and "ZC" Options	1	1	
Fig. 8, "J" Option	1	1	
Fig. 9	1	1	
Fig. 11, "ZC" and "ZK" Options	1	1	G
Alarm Ckt, SD-80893-01: Fig. 1	1	1	
Voltage Regulator, J86727E, List 2		1	H

List 17 - Wiring and equipment required in addition to list 1 or 16 for providing drum-interrupter tone supply (60-ipm line-busy tone and 120-ipm paths-busy tone) for No. 355A dial offices.

	Wire	Equip	See Notes
Ringing Ckt, SD-80885-01: Fig. 1, "V" and "PP" Options Only	1	1	
Signaling Ckt, SD-80886-01: Fig. 12	1	1	
Fig. 16, "Z," "ZM", and "ZR" Options	1	1	C,J

List 18 - Wiring and equipment required in addition to list 1 or 16 for providing static-tone generator supply with drum-interrupter reserve (60-ipm line-busy tone and 120-ipm paths-busy tone) for No. 355A dial offices.

	Wire	Equip	See Notes
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Ringing Ckt, SD-80885-01, Fig. 1, "V" and "PP" Options Only	1	1	
Signaling Ckt, SD-80886-01: Fig. 16, "Z," "ZM", and "ZR" Options	1	1	C,J
Fig. 17	1	1	
Alarm Ckt, SD-80893-01, Fig. 1	1	1	

List 19 - Wiring and equipment required in addition to list 1 or 16 for providing drum-interrupter tone supply (60-ipm line-busy and 120-ipm paths-busy tone) for step-by-step No. 1 and 350A dial offices.

	Wire	Equip	See Notes
Ringing Ckt, SD-80885-01: Fig. 1, "V", "PP", and "QQ" Options Only	1	1	
Signaling Ckt, SD-80886-01: Fig. 18, "ZP", and "ZW" Options	1	1	D,K,L,
Alarm Ckt, SD-80893-01, Fig. 3, "R" Option	1	1	

List 20 - Wiring and apparatus for connection to ringing demand meter.

	Wire	Equip	See Notes
Ringing Ckt, SD-80885-01, Fig. 14	1	1	M

List 21 - Wiring and equipment required in addition to list 19 to reduce modulation of the LT1 60-ipm line-busy tone by the LT1 120-ipm paths-busy tone.

	Wire	Equip	
Signaling Ckt, SD-80886-01, Fig. 18, "ZU" Option	1	1	

Notes

A. This equipment is arranged to mount on 23-inch relay rack drillings. Framework shall be ordered separately, as required.

- B. The ringing panels are arranged to mount ringing machines per J86596A, List 4 or 5.
- C. Installer shall disconnect "Z" wiring from LT2 capacitor when this circuit is used in an office with selector repeaters.
- D. If this equipment is held in stock or otherwise out of service, electrolytic F capacitor and LT1 shall be connected to a source of direct current of suitable voltage and polarity as covered in Section 032-110-701.
- E. Furnish "QQ" option for No. 350A dial office only.
- F. In No. 355A dial offices, furnish list 16 only in offices with superimposed ringing.
- G. In No. 350A dial offices, furnish "ZL" option for ac-dc ringing and "ZM" option for superimposed ringing.
- H. The use of the voltage regulator permits an increase in capacity of the KS-5546, List 14 or 15 ringing machine from 0.25 ampere, 72 to 88 volts to 0.5 ampere, 84 to 88 volts in step-by-step No. 1 and No. 350A dial offices.
- I. Furnish "ZK" option in Fig. 6 or 7.
- J. Furnish continuous low tone LT1 paired with LT1R ground for No. 355A dial offices.
- K. Furnish continuous low tone leads LT1C and LT1D and 30-ipm BR1 for step-by-step No. 1 and 350A dial offices.
- L. In Fig. 18, "ZP" and "ZW" options furnish LT6 60-ipm BR2 line-busy tone for offices in which connector shelf circuits are arranged (or converted) to prevent talking over busy tone. In offices not having this feature, furnish "ZO" option (A&M Only) which provides LT1 60-ipm BR2 or LT4 60-ipm BR4 line-busy tone.
- M. Furnish "ZY" option in Fig. 10 or 11

J86596C (AT&TCo Std) - Ringing Equipment for No. 11 Manual Offices

Equipment - J86596C- ()

List 2 - Assembly, wiring, and common equipment without voltage regulator.

See
Wire Equip Notes

Ringng Ckt, SD-80895-01, Fig. 2, "P" and "F" Options	1	1	B,C,D
Signaling Ckt, SD-80886-01, Fig. 7 and 10	1	1	
Alarm Ckt, SD-80893-01, Fig. 1, 2, and 4	1	1	

List 3 - Wiring and equipment required in addition to list 2 for providing static-tone generator supply with drum-interrupter reserve.

Wire Equip

Signaling Ckt, SD-80886-01, Fig. 8	1	1
Alarm Ckt, SD-80893-01, Fig. 1	1	1

List 4 - Assembly, wiring, and common equipment with voltage regulator.

See
Wire Equip Notes

Ringng Ckt, SD-80895-01, Fig. 2, "N" and "F" Options	1	1	B,C, D,E
Signaling Ckt, SD-80886-01 Fig. 7 and 10	1	1	
Alarm Ckt, SD-80893-01, Fig. 1, 2, and 4	1	1	
Voltage Regulator, J86727E, List 2		1	F

List 5 - Assembly, wiring, and equipment for KS-5546, List 15 ringing machine (machine, plug, and mounting details) per SD-80895-01, Fig. 1 with "F" option. (See note A.)

Notes

- A. When 4-party selective superimposed ringing is furnished, "W" wiring shall be disconnected at the plug and replaced by "Z" wiring.
- B. This equipment is arranged to mount on 23-inch relay rack drillings. Framework shall be ordered separately, as required.
- C. This equipment is arranged to mount ringing machines per J86596C, List 5.
- D. If this equipment is held in stock or otherwise out of service, electrolytic F capacitor shall be connected to a source of direct current of suitable voltage and polarity as covered in Section 032-110-701.

- E. Furnish "J" option for ac-dc ringing and "K" option for superimposed ringing.
- F. The use of the voltage regulator permits an increase in capacity of the KS-5546, List 15 ringing machine from 0.25 ampere, 72 to 38 volts to 0.5 ampere, 84 to 88 volts.

J86596D (AT&TCo Std) - Howler Supply for Step-by-Step No. 1, 350A, and 355A Dial Offices

Equipment - J86596D-()

- List 1 - Wiring and equipment per SD-80886-01, Fig. 10 and SD-80893-01, Fig. 2 for providing howler supply.

J86596E (AT&TCo Std) - Ringing Equipment for 701B and 711B PBXs Using KS-5546, List 15 (0.5 Ampere) Ringing Machine

Equipment - J86596E-()

- List 1 (A&M Only) - Assembly, wiring and equipment for KS-5546, List 15.

- List 5 - Assembly, wiring, and common equipment for 0.5 ampere plant. (See note E).

	See Wire Equip Notes			
Ringing Ckt, SD-80885-01: Fig. 1 and 1B, "T", "HH", "KK", "ZC", "ZU", and "ZJ" Options	1	1	A,B	
Fig. 2, "J" and "ZC" Options	1	1	C	
Fig. 6, "X" and "ZI" Options	1	1		
Fig. 8, "J" Option	1	1		
Fig. 9	1	1		
Fig. 13, "ZB" Option	1	1		
Signaling Ckt, SD-80886-01: Fig. 19, "ZT" or "ZV" Option	1	1	D	
Alarm Ckt, SD-80893-01: Fig. 1	2	2		

- List 6 - Wiring and equipment required in addition to list 5 for providing 120-ipm paths-busy tone.

	Wire	Equip
Signaling Ckt, SD-80886-01, Fig. 20	1	1

- List 7 - Wiring and apparatus for connection to ringing demand meter.

	Wire	Equip
Signaling Ckt, SD-80885-01, Fig. 15	1	1

- List 8 - Apparatus and wiring for a single TOUCH-TONE dial tone generator to be used with 701B and 711B PBXs serving less than 200 lines.

	See Wire Equip Notes		
404D Tone Generator	1	E,F	
Signaling Ckt, SD-80886-01: Fig. 21	1	1	

- List 9 - Apparatus and wiring for a duplicate TOUCH-TONE dial tone generator to be used with 701B and 711B PBXs serving between 200 and 4000 lines.

	See Wire Equip Notes		
405B Tone Generator	1	E,F	
Signaling Ckt, SD-80886-01: Fig. 22	1	1	

Notes

- A. This equipment is arranged to mount on 23-inch relay rack drillings. Framework shall be ordered separately, as required.
- B. This equipment is arranged to mount ringing machines per J86596A, List 5.
- C. If this equipment is held in stock or otherwise out of service, electrolytic F capacitor shall be connected to a source of direct current of suitable voltage and polarity as covered in **Section 032-110-701**.
- D. Furnish "ZV" option for 120-ipm paths-busy tone and "ZT" option for 60-ipm line-busy tone.
- E. List 8 or 9 is required in addition to List 5.
- F. List 8 or 9 may be furnished for 701A and 711A PBXs (A&M Only) on a job-engineered basis.

J86596F (AT&TCo Std) - Ringing Equipment for No. 35E97 Dial Offices

Equipment - J86596F-()