AMERICAN TELECOMMUNICATIONS CORPORATION
MODEL 104 *TonePulse** CONVERTER
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section is a cover sheet for the American Telecommunications Corporation (ATC) TonePulse Converter Model 104 instruction, Section 10-200. GAEL 1660-1 authorizes the use of this equipment in Pacific Company.

1.02 (Reserved for future use)

1.03 The ATC Model 104 TonePulse Converter used in Step-by-Step (SXS) is rated manufacturer discontinued (Mfr Disc). The Model 204 used in No. 1 crossbar offices and SXS (covered in Sections 216-251-900PT and 227-675-901PT) replaces the Model 104.

1.04 The Model 104 converter is a solid-state device which is used to convert "*Touch-Tone*®" signals to dial pulse and can be used in a combination rotary dial and *Touch-Tone* groups.

1.05 Due to the effects that nonprecise dial tone may have on the converter, it is necessary to limit their installation to offices equipped with precise dial tone.

Note: In SXS offices, it should be noted that if *Touch-Tone* subscribers wish end-to-end signaling a polarity guard kit must be installed in the subscriber's *Touch-Tone* set.

1.06 If corrections are required in the manufacturer's instruction, use Form E-3973-1PT as described in Section 000-010-901PT to process the correct information.

1.07 If equipment design and/or manufacturing problems should occur, refer to Section 010-700-010PT for procedures on how to file an Engineering Complaint.

1.08 When revised instructions reflect changes due to modification of equipment, retain the superseded information until equipment is modified.

Note: Equipment shall *not* be modified without approval of the Equipment Maintenance Engineer.

2. TRAINING

2.01 Minimal training is required as no repair work will be performed on the converter by TELCo maintenance forces.

3. MAINTENANCE

3.01 Field repairs that involve replacement or modification of components within this unit are not recommended.

3.02 If the seals on a returned unit are broken, the warranty could be rendered null and void.

3.03 The ATC could (at their discretion) refuse to perform any requested work on units out of warranty.

3.04 Refer to Section 227-675-901PT, Appendix 1, for acceptance test procedures for the Models 104 and 204 TonePulse Converters.

4. ORDERING PROCEDURES

4.01 Detailed ordering information is covered in GAEL 1660-1.

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5. REPAIR/RETURN

5.01 ATC provides a factory repair and/or modification service for the converter. A return authorization must be obtained from ATC (call 213 + 579-1710).

5.02 ATC will send a packaging label to affix to the package. This label lists the address where the unit is to be shipped for repair and/or modification.

5.03 A GTP 2161 Return Material Tag must be attached to the unit prior to shipping to ATC.

Note: A flat charge of $30.00 will be made for units that require repair after the warranty has expired.

5.04 Modification for the lock-out feature on the Model 104 costs $41.77 per unit. Units modified for this feature will be relabeled with a green label and have a # sign after the model number (eg, 104#2).

Attachment:

American Telecommunications Corporation **TonePulse** Converter Model 104, Section 10-200, Issue 1, December 1974

TONEPULSE™ CONVERTER MODEL 104

APPLICATION, INSTALLATION AND CONNECTION

1. GENERAL

This section provides a brief description, installation instructions and connecting information pertaining to the installation of TonePulse Converter, Model 104, to step-by-step type central offices and PABX equipment.

1.01 Section 10-100 provides a general description of the design features, identification and technical data summary.

2. CONCEPT

2.01 The Model 104 TonePulse Converter converts DTMF signals generated from TouchTone(R) telephones to dial pulses which can be used by step-by-step equipment.

2.02 The Converter can be used with all TouchTone® instruments or with a mixture of TouchTone® and rotary dial instruments.

2.03 The Model 104 TonePulse Converter (Figure 1) is a compact solid state device which measures 4" x 4½" x 2½" deep. The Converter can be, by means of the mounting bracket furnished with each TonePulse Converter, applied directly to the angle iron framework immediately behind the linefinder switch in Strowger step-by-step switching systems (reference paragraph 7). In this application, additional floor space is not required in central offices.

2.04 When used in non-Strowger offices or on installations where angle iron mounting is restricted a converter mounting frame assembly, 100339, can be used which accommodates five TonePulse Converters. A 24 point terminal block is included with this frame assembly for the purpose of interconnecting the TonePulse Converter between the linefinder and the foward equipment. The frame assembly is designed for 19" relay-rack mounting and contains its own fusing (1 amp per Converter). An alarm lead is also located on the terminal block. (Figure 2)

3. IDENTIFICATION

TonePulse Converter

• Model 104-01	10 pps output 48 VDC operation
• Model 104-02	10 pps output 48 VDC output with time out strapping option
• Model 104-03	Same as 104-02 Except 24 VDC
• Model 104-04	Same as 104-02 with ANI

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Tonepulse™ trademark of A.T.C.

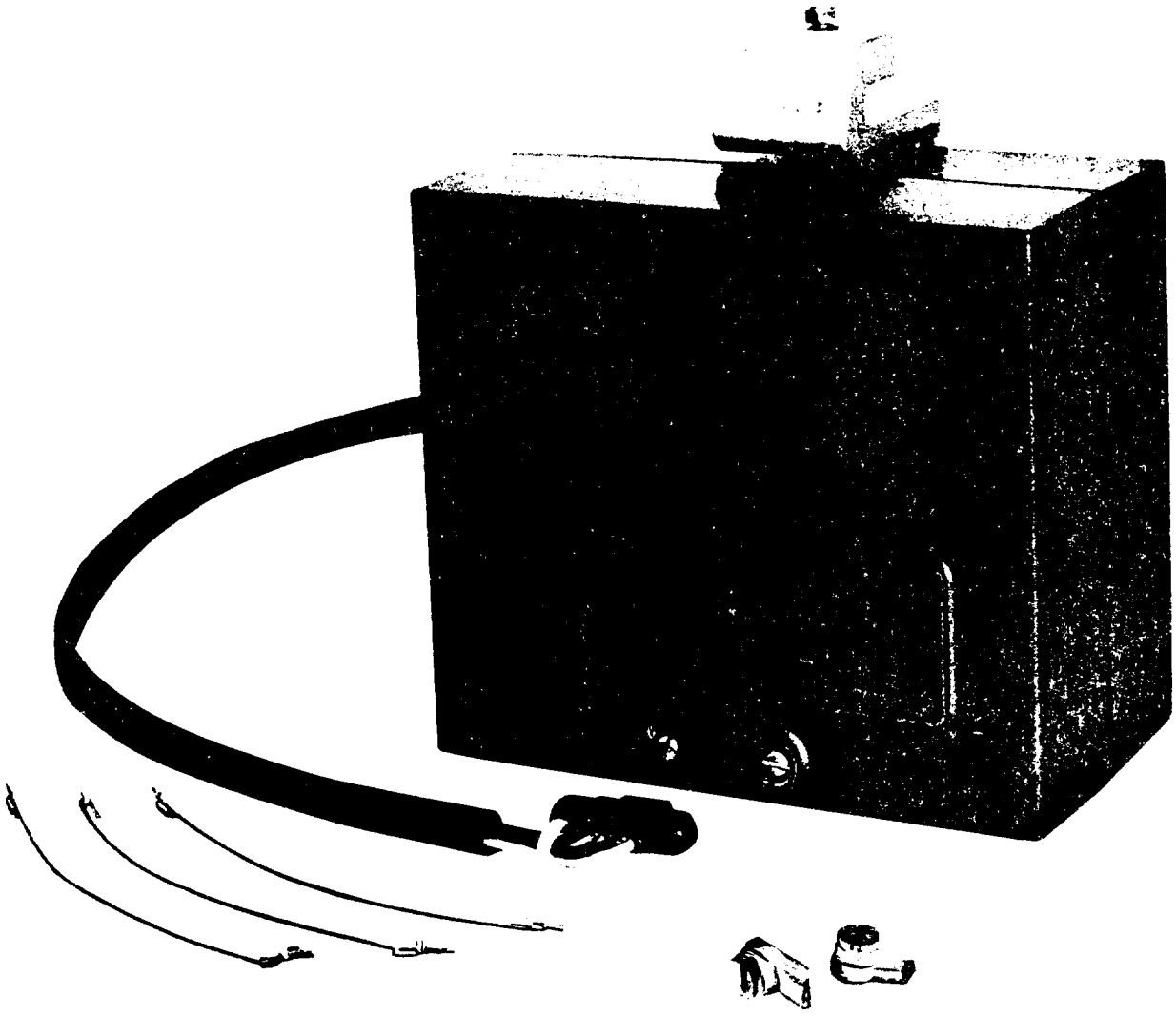

Figure 1. TonePulse Converter

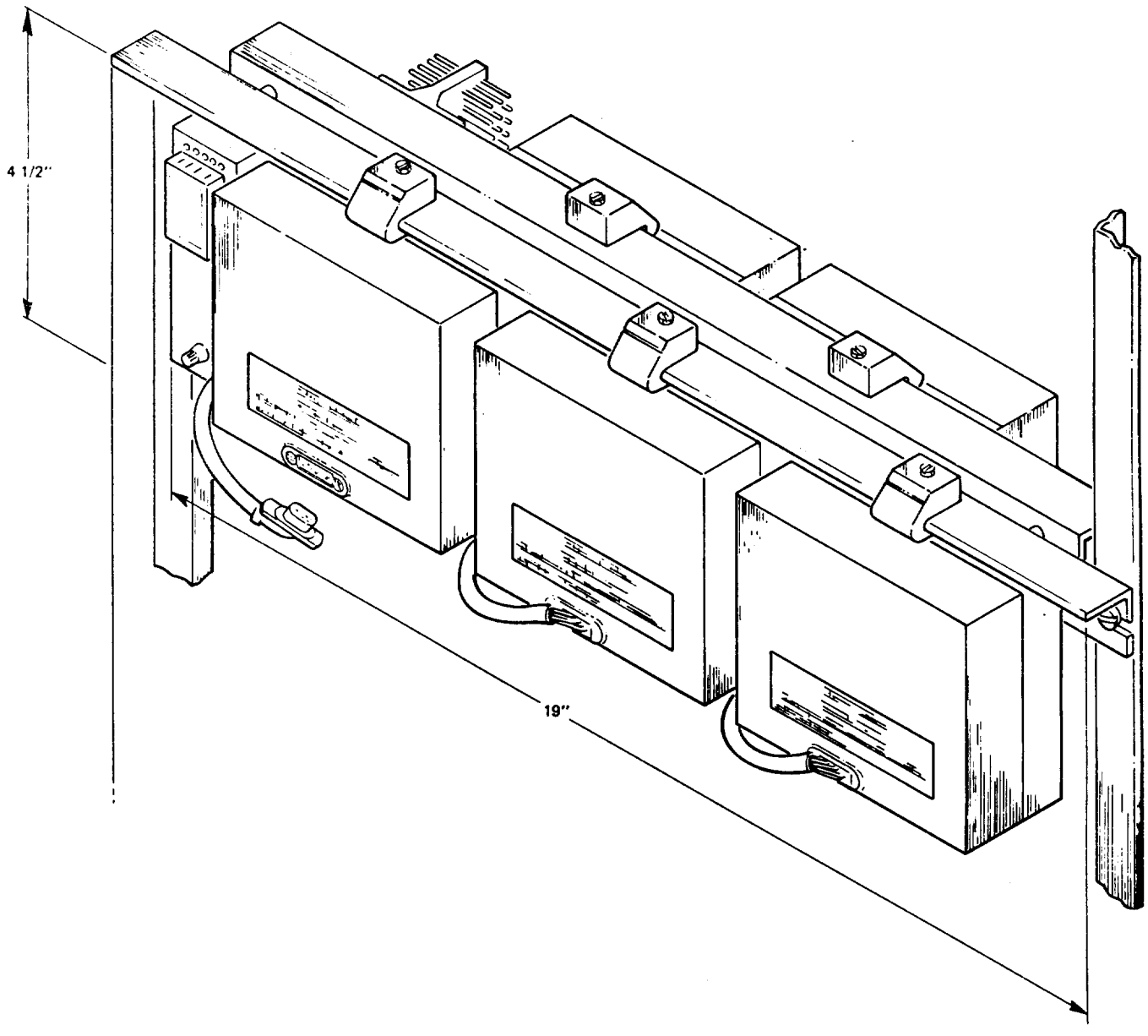

Figure 2. Mounting Frame Assembly

3.02 Replaceable Components
(Furnished with the Converter)

- 12-108-9 Set of programming wires
- 721006-01 Splice connectors
- 10-319 Cable Harness Assembly - 18" length

3.03 Associated Apparatus
(Ordered separately if required)

- 10-319-5 Cable Harness — 48" length
- 100339 Converter Mounting Frame

3.04 Test Equipment

- Standard TouchTone ® telephone equipped with a plug to adapt to The line finder test jacks.
- Rotary dial handtest telephone equipped with a plug to adapt to the line finder test jacks.

4. PRE-INSTALLATION REQUIREMENTS

4.01 The TonePulse Converter consists of basically three elements, the Converter proper, a connecting plug-in cable and programming straps, which are for use in PBX applications. (See paragraph 6).

4.02 The installation of the connecting cable requires two splices. 3M Company's Scotchlock Type UY Connectors are recommended for this purpose and are furnished with the Converter.

4.03 Power Requirements

The Models 104-01, 104-02 and 104-04 are 48V 10 pps Converters. These units will operate satisfactorily over a voltage range of 44-56 VDC. Model 104-03 is a 24V 10 pps Converter which operates over a range of 18-26 VDC. See Table A for current drain and fusing requirements.

CAUTION

DO NOT CONNECT THE CONVERTER TO VOLTAGES OTHER THAN SPECIFIED IN TABLE A. INCORRECT VOLTAGES MAY CAUSE PERMANENT DAMAGE.

4.04 The battery source for the linefinder should be adequately fused with approximately 1 1/3 amp fuse per finder or a 5 amp fuse for each 5 linefinders. This fusing will serve to protect the TonePulse Converter since it also uses a battery and ground connection from the linefinder. A Converter will always operate after the linefinder has found the line requesting service and, therefore, this fusing will suffice for both the linefinder and the TonePulse Converters.

4.05 For fusing requirements for other than Strowger applications, see Table A.

TABLE A

Model	Voltage Range (VDC)	Current Idle (ma)	Drain Pulsing (ma)	Separate Fusing (Amps) If Required
104-01	44-56	80	280	1/2 AMP
104-02	44-56	70	130	1/3 AMP
104-03	18-26	150	280	1/2 AMP
104-04	44-56	70	130	1/3 AMP

5. INSTALLATION PROCEDURE

5.01 Carefully remove the Converter, its associated cable harness and jumper straps and splices from the packing container.

5.02 Check the linefinder for busy, and when it is idle, make it busy.

5.03 Remove the linefinder fuse.

5.04 Unsolder or unwrap the tip and ring leads from the jacks of the linefinder.

5.05 Splice the white-orange lead of the cable harness to the tip lead that was disconnected from the linefinder jacks in Step 5.04. Similarly, splice the orange-white lead of the harness to the ring lead. (Per Table B)

TABLE B

	Color	Function	Notes
INPUT	Blue/White	Ring	Normally from the linefinder
	White/Blue	Tip	Normally from the linefinder
OUTPUT	Orange/White	Ring	Normally to the first selector
	White/Orange	Tip	Normally to the first selector
POWER	White	-48VDC	
	Red	Ground	

5.06 Connect the white-blue and blue-white leads of the harness to the tip and ring jacks of the linefinder respectively.

5.07 Connect the red lead of the harness to the linefinder ground jack terminal.

5.08. Connect the white lead of the harness to the linefinder battery jack terminal.

5.09 Dress the cable harness along the shelf wiring and secure (tie wraps can be used for this purpose). Leave about four inches of harness cable extending beyond the last tie. The last tie should be approximately at the center of the linefinder.

5.10 Replace the linefinder fuse.

6. STRAPPING THE CONVERTER

6.01 When used in a dial PBX, strapping is required when the dial PBX is trunked to a central office which is equipped for TouchTone®. A strapping field to accommodate this requirement is located on the back of the Converter. (See Figure 3)

6.02 Determine the access code to the central office equipped with TouchTone®. Only a single digit access code can be accommodated.

6.03 Using the jumper straps furnished, strap the code digit terminal to one of the A, B, or C terminals. A maximum of three such codes may be strapped.

6.04 When the Converter is used in an application where timeout is not required, strap terminal X to terminal Y using one of the jumper straps furnished. Model 104-01 TonePulse Converter does not contain this option.

CAUTION

DO NOT CONNECT MORE THAN ONE LEAD TO ANY LETTERED TERMINAL.

DO NOT ALLOW TIP AND RING CONNECTIONS OR FOREIGN VOLTAGE TO COME IN CONTACT WITH THESE PROGRAMMING TERMINALS, SINCE THEY MAY CAUSE PERMANENT DAMAGE TO THE CONVERTER.

7. MOUNTING THE CONVERTER

7.01 Place the mounting bracket over the shelf angle iron approximately at the center of the linefinder.

7.02 In most Strowger installations, the shelf iron on which the Converter is to be located is positioned such that the Converter can be mounted directly in the configuration as received from the factory. However, in some vintages of equipment, the angle iron is located toward the lower portion of the switch, and therefore, requires repositioning of the Converter mounting bracket. This is easily accomplished by removing the ¼" nut at the rear of the Converter, rotating the bracket 180° and retightening the nut. (Figure 3)

7.03 Tighten the locking screw with a screwdriver or a switch adjusting wrench until the Converter is secure. Do not overtighten the locking screw.

7.04 Insert the plug of the Converter cable harness into the receptacle of the TonePulse Converter until it locks in place.

7.05 To remove plug, insert screwdriver under one ear of the plug and pry outward.

8. TESTING THE CONVERTER

8.01 Connect a TouchTone® telephone, equipped with a proper plug to the linefinder test jacks.

8.02 TonePulse any number. Verify that the correct number has been reached and that a transmission path exists. Depress and release a button on the test telephone. Verify that no further outpulsing occurs.

8.03 TonePulse a digit and hold the button down for an extended period of time (1-2 seconds) - no pulsing should occur. Release the button and correct digit should be pulsed.

8.04 TonePulse any digit. Wait approximately 20 seconds and attempt to TonePulse additional digits. Verify that no outpulsing occurs. If X and Y terminals are strapped, the Converter will continue to outpulse each time a button is depressed and released.

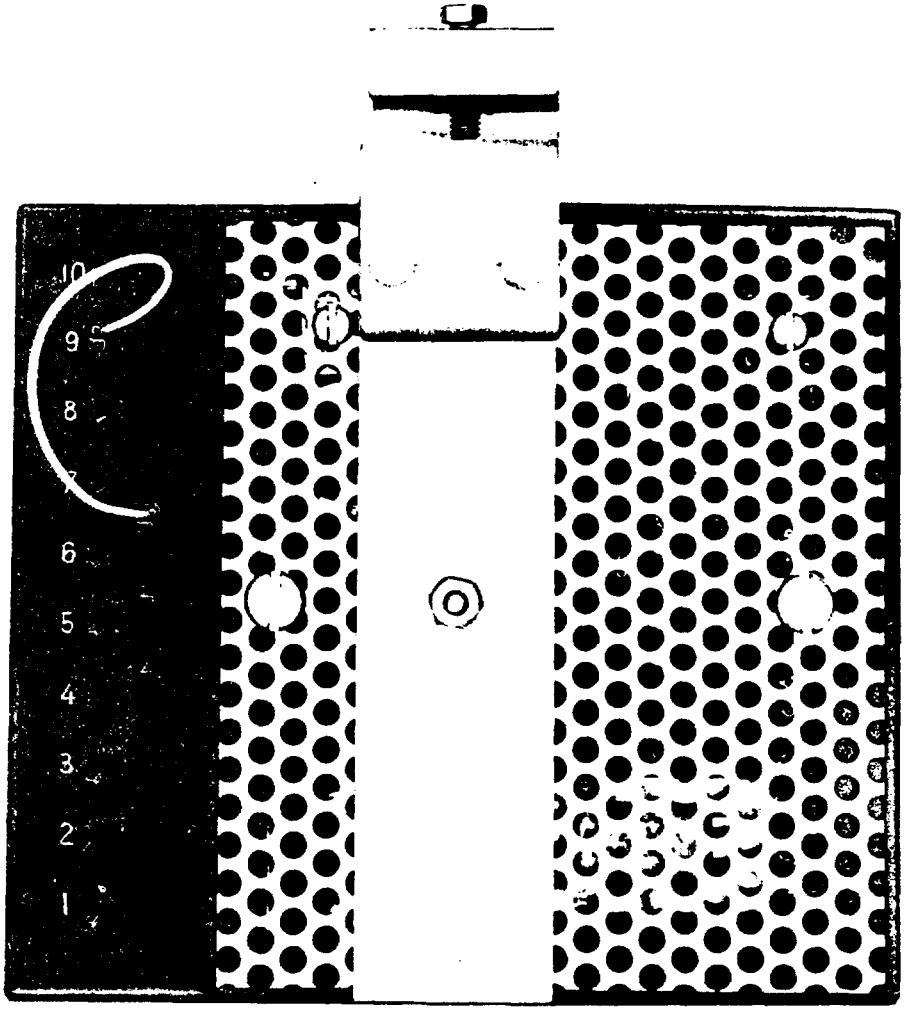

Figure 3. Use of PBX Jumper Straps (Model 104)

8.05 If the TonePulse Converter has been strapped for first digit recognition, TonePulse the digit strapped. Verify that second dial tone is heard. TonePulse additional digits. No outpulsing should take place.

8.06 Connect a rotary dial telephone (or handtest telephone) to the linefinder test jacks. Dial a test number. Verify that the desired number is reached.

9. TROUBLE CONDITIONS

9.01 If other than precise dial tone is used, frequencies may be present which conflict with the standard TouchTone® frequencies and cause improper operation of the Converter. Three conditions may occur -

- Digits are generated immediately after an off-hook condition.
- No dial pulses would be generated after a button has been depressed and released.
- Double digits may occur. A digit will be generated on button depression and again when the button is released.

If any of these conditions are present, installation of precise dial tone may be required.

9.02 The TonePulse Converter is sensitive to tip and ring reversal. If a reversal occurs, for example, on the wipers of a second or third selector; the TonePulse Converter will pulse digits towards that equipment until this reversal occurs. If only a partial number is outpulsed from the Converter, an inadvertent reversal of tip and ring is probably occurring in the forward equipment.

CAUTION

DO NOT ATTEMPT ANY FIELD REPAIR OF THE TONEPULSE CONVERTER. OPENING OF THE ENCLOSURE WILL NULLIFY THE FACTORY WARRANTY.