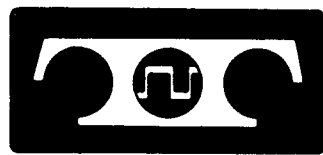


BULLETIN 235B

**TECHNICAL MANUAL
28 TRANSMITTER DISTRIBUTOR
SET
(SINGLE CONTACT)
LXD**



TELETYPE[®]
CORPORATION

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INTRODUCTION

Bulletin 235B provides description, adjustments, lubrication, and disassembly and reassembly procedures for the Model 28 Single Contact Transmitter Distributor Set, the transmitter distributor unit and the single and multiple mounted transmitter distributor bases.

The bulletin is made up of a group of appropriate, independent sections. They are separately identified by title and section number, and the pages of each section are numbered consecutively, independent of other sections.

The identifying number of a section, a 9-digit number, appears at the top of each page of the section, in the left corner of left-hand pages and the right corner of right-hand pages. The sections are placed in the manual in ascending numerical order.

To locate specific information refer to the table of contents on the following page. Find the name of the involved component in column one and the title of section in column two. The correct 9-digit section number will then be found in column three. Turn to page one of the section indicated where the contents of that section will be found (except where a section is small and does not require a listing of contents).

Note: Information previously contained in Bulletin 258B is now included in Bulletin 235B in its 9-digit sectionalized form.

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Note: For information on motor units, see Bulletin 295B.

28 SELF-CONTAINED TRANSMITTER DISTRIBUTOR SETS
(SINGLE CONTACT AND MULTICONTACT)

CONTENTS		DESCRIPTION
	PAGE	
1. GENERAL.	1	of Baudot code signals and transmitted over a signal line or radio channel. It is a sending unit only.
2. TECHNICAL DATA.	2	1.04 Transmission may be performed at 60, 75, or 100 words per minute depending on the set of gears used between the motor and the intermediate gear assembly. Signaling between a transmitter distributor and a distant station is accomplished electrically by use of the 5-unit start-stop permutation code, and may utilize the 7.42 unit transmission pattern or the 7.00 unit transmission pattern depending on the transmitting cam sleeve used.
3. SINGLE CONTACT SETS.	3	
REGULAR SIZE SET.	3	
MINIATURIZED SET.	4	
4. MULTICONTACT SET.	6	1.05 Each set is equipped with a control switch for turning the set off without disconnecting it from the signal circuit. Most sets are equipped with an automatic line shunting switch which closes the loop signal circuit when the transmitter distributor is removed from its base.
1. GENERAL		
1.01 This section describes three 28 Self-Contained Transmitter Distributor Sets. They are the Single Contact, Multicontact, and Miniaturized sets. To provide clarity for the sets, each is separately described and illustrated. The following descriptions and illustrations are of typical sets.		1.06 Power is brought into each set through a power switch to the motor or motor unit. The motor or motor unit provides motive power for driving the transmitter distributor unit through an intermediate gear assembly.
1.02 A typical 28 Self-Contained Transmitter Distributor Set consists of a base, transmitter distributor unit, a motor or motor unit, and a cover. The base and cover may be regular size as illustrated in Figures 1 and 5 for use with a motor unit, or they may be a miniaturized design for use with a small motor as illustrated in Figure 3.		1.07 The message signals are read from the perforated tape, either chadless or fully perforated, and transmitted by either a 0.020 or 0.060 ampere dc line current to external receivers.
1.03 A transmitter distributor set is an electromechanical unit of communication equipment used to read code combinations perforated in a paper tape. The mechanical action initiated by the code combinations in the tape is translated into electrical impulses in the form		1.08 A three-position control switch is provided on each transmitter distributor unit for placing the set in RUN position to read tape; STOP position to stop tape reading; and FREE position to free the feed wheel so that tape may be fed under the tape lid into the tape guide without raising the lid.

2. TECHNICAL DATA

WEIGHTS AND DIMENSIONS

Transmitter Distributor Set	Approx. Dimensions (Inches)			Approx. Weight
	Height	Width	Depth	Pounds
Single Contact (Regular)	7	7-1/2	14-1/2	26-1/2
Single Contact (Miniaturized)	6	7-1/2	9-1/2	15
Multicontact	6	9	16	26

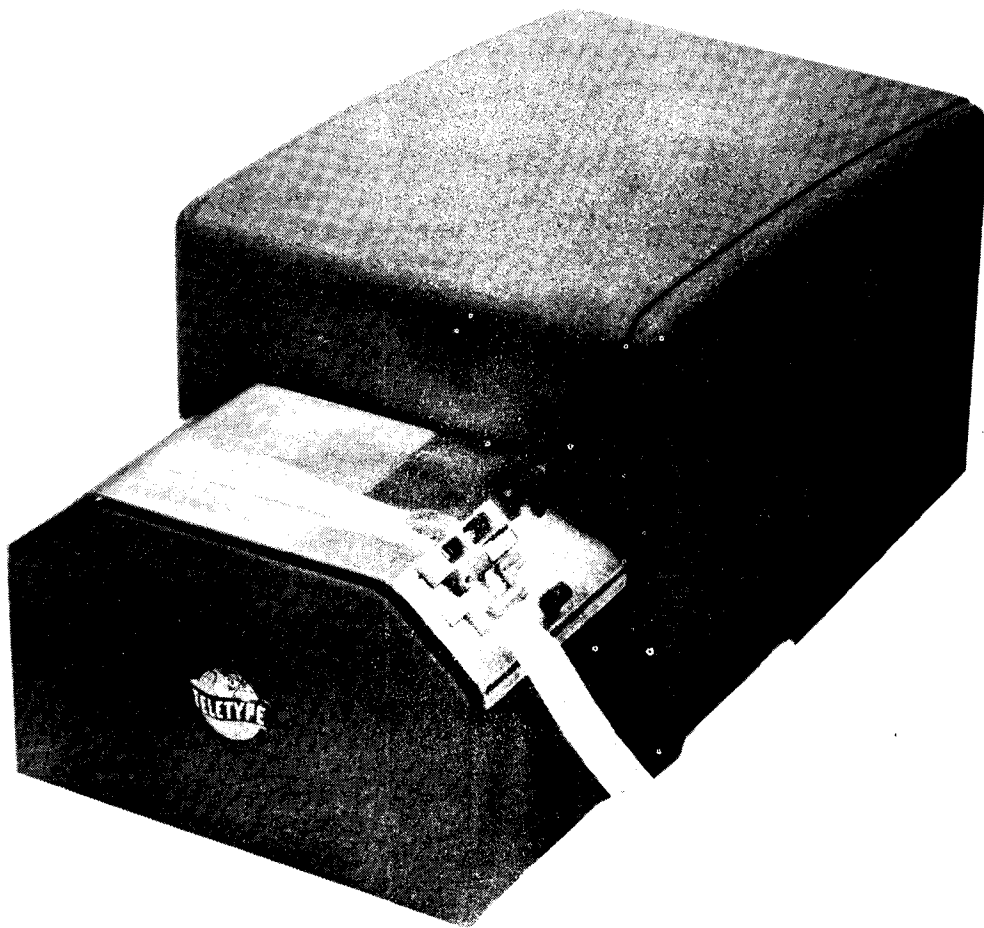


Figure 1 - Regular Size 28 Transmitter Distributor Set (Single Contact)

3. SINGLE CONTACT SETS

3.01 The transmitter distributors used in the two single contact sets (regular size, and miniature size) are identical as to function and configuration. The single contact mechanism is actuated once for each level of the code combination by a distributing cam sleeve. The code combinations sensed in the message tape are mechanically transferred to the single contact signal generator where they are translated into electrical impulses and transmitted sequentially to the signal line.

3.02 The transmitter distributor used in these sets may be equipped with code reading contacts for multiwire (simultaneous) output as an optional feature. By use of these contacts, which are actuated by the individual transfer levers, the tape message is electrically transmitted by parallel wires to external receivers

for monitoring purposes or page copy. This is done simultaneously with transmission through the single contact signal generator.

REGULAR SIZE SET

3.03 The regular size single contact transmitter distributor set (Figure 2) consists of a base, a motor unit, transmitter distributor unit and a cover. The base extends a full length of the set, and is equipped with an intermediate gear assembly and vibration mounts. It serves as a mounting for a transmitter distributor unit, and a standard size 28 motor unit which may be either a 115 volt, 60 cycle, ac synchronous, or a 115 volt series governed.

3.04 A slip-over type cover encloses the motor unit and that portion of the base not occupied by the transmitter distributor unit.

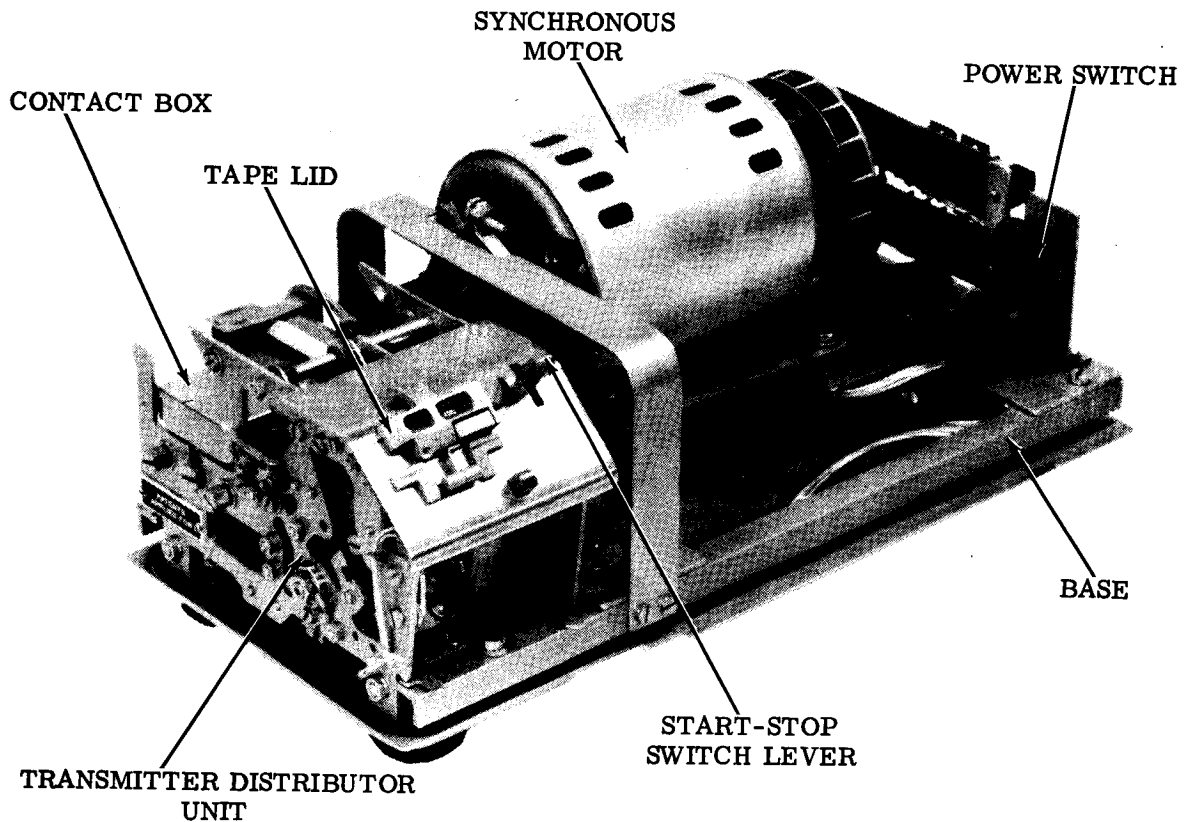


Figure 2 - Regular Size 28 Transmitter Distributor Set
(Cover, Coverplate, and Panel Removed)

SECTION 573-105-100TC

3.05 A U-shaped front panel covers three sides of the transmitter distributor. This panel snaps into position. It is easily removed for access to the mechanism of the transmitter distributor.

MINIATURIZED SET

3.06 The miniaturized set has been so characterized because of its compactness (Figure 4). The smallness in size is accom-

plished through design of the base and cover, and by use of a compact 23 millihorsepower synchronous motor. This set performs the same function as the regular size set; yet it occupies less space by about five inches in depth. The cover is the slip-over type which houses the remaining portion of the set other than the transmitter distributor. The U-shaped front panel is the same as that for the regular size set.

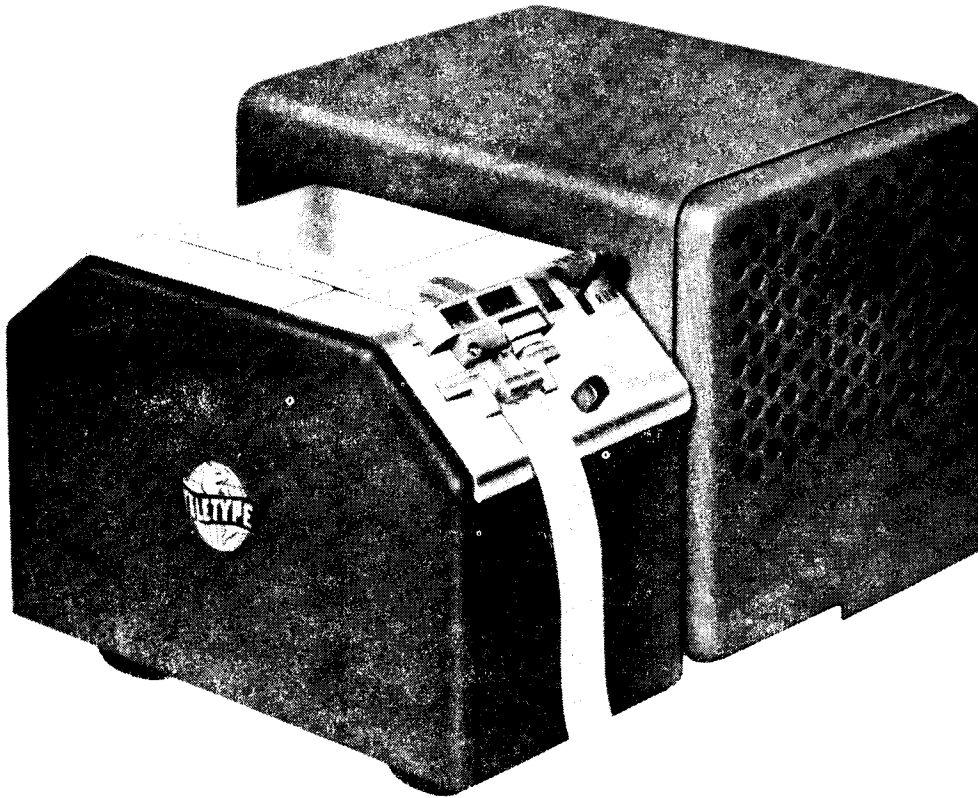


Figure 3 - Miniaturized 28 Transmitter Distributor Set (Single Contact)

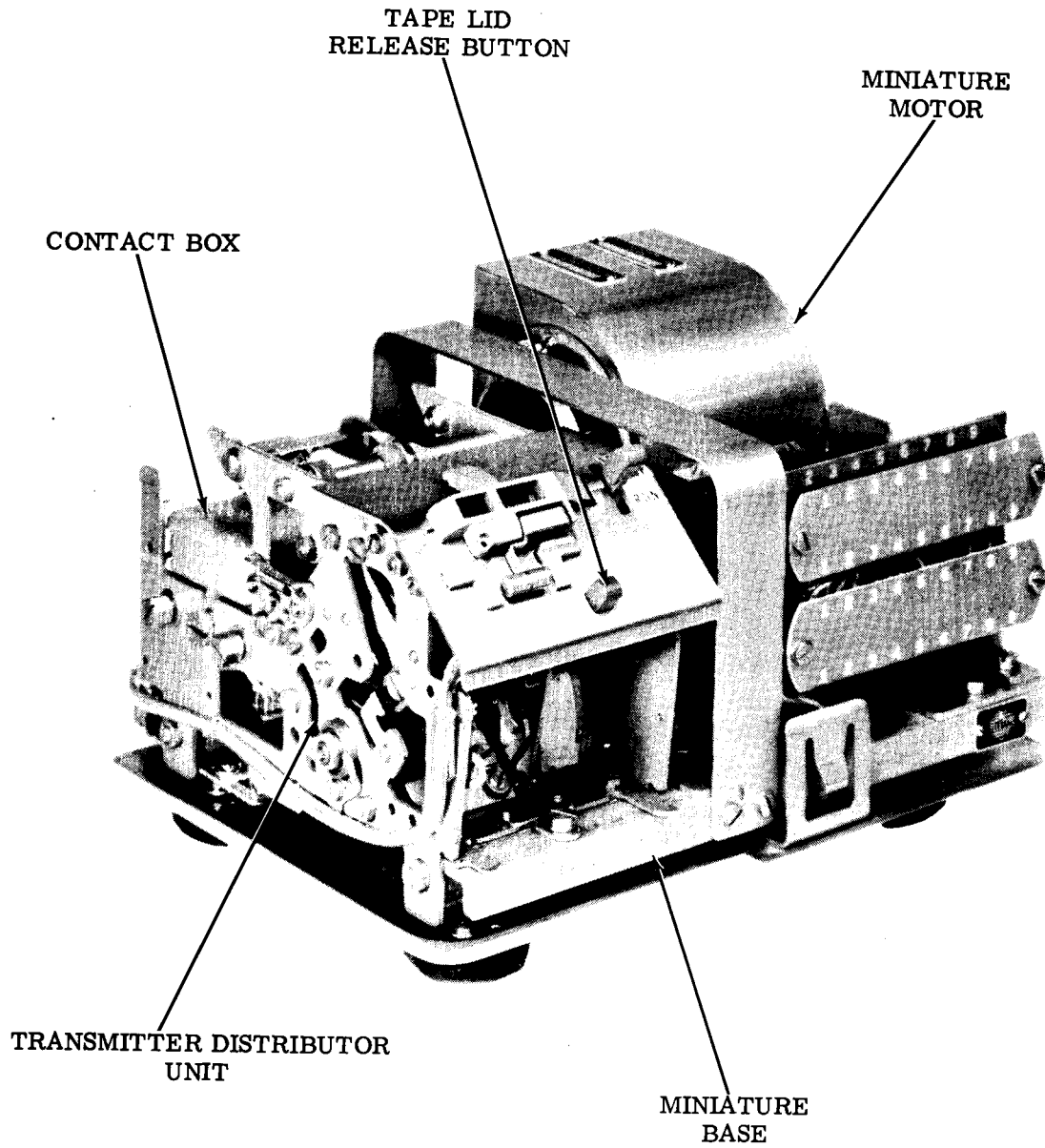


Figure 4 - Miniaturized 28 Transmitter Distributor Set
(Cover, Coverplate and Front Panel Removed)

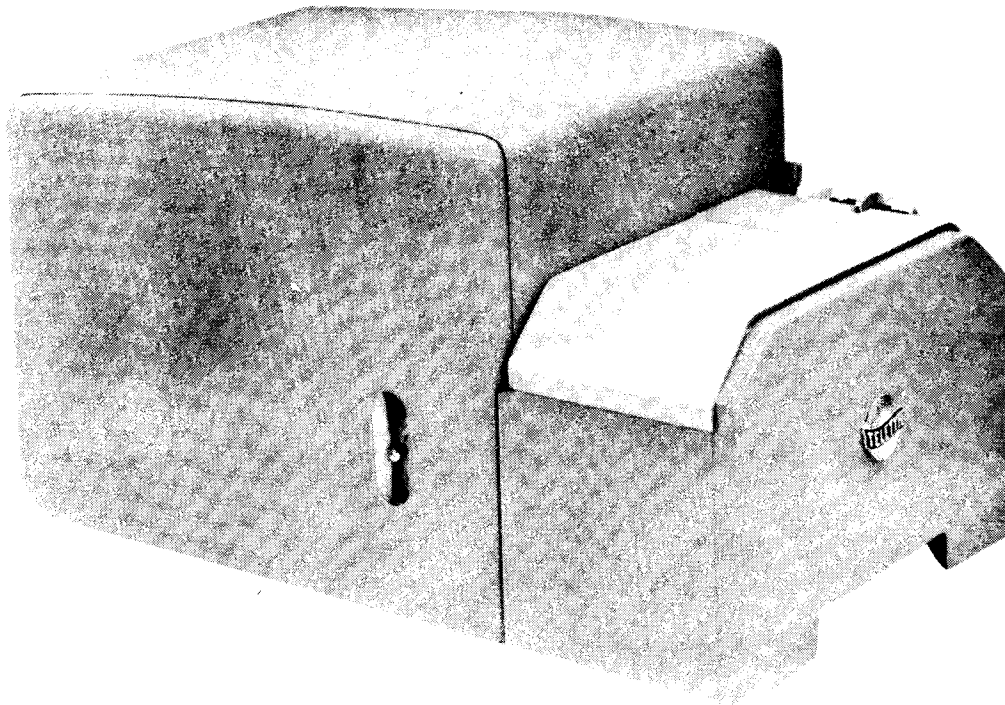


Figure 5 - 28 Transmitter Distributor Set (Multicontact)

4. MULTICONTRACT SET

4.01 The multicontact transmitter distributor set (Figure 6) is approximately two inches wider and two inches deeper than the single contact set. It is driven by a full size 28 motor unit which may be either synchronous or governed.

4.02 The function of this set is somewhat different from that of the single contact set. The sensing and distributing mechanisms are capable of being actuated independently of each other either locally or from a remote source, or they may be actuated in conjunction with each other as a straight through transmitter distributor.

4.03 The wiring of this set terminates at two 24-point connectors located at the rear of the base to provide external control, and the output or input of multiwire transmission.

4.04 The versatility of this set makes it possible to transmit the tape message by parallel wire to an external receiver for message verification, or error detection. Like-

wise, it is possible to return parallel wire input to the distributing portion of the set for sequential transmission.

4.05 Auxiliary contacts are provided in the set, and operate from the sensing cam sleeve for controlling external circuits.

4.06 An auxiliary contact is provided at the distributor cam sleeve for controlling the clutch on the sensing shaft.

4.07 An index mark is provided seven characters ahead of the sensing pins for aligning the starting point of the message tape.

4.08 The spring biased tape lid may be raised for inserting message tape by depressing a plastic tape lid release plunger.

4.09 Transmission of tape may be stopped by operating the start-stop switch lever, by raising the tape lid, or allowing tape to run out. When the tape lid is raised or when tape runs out, the tape-out sensing pin rises and breaks a circuit to the sensing clutch magnet through its contact.

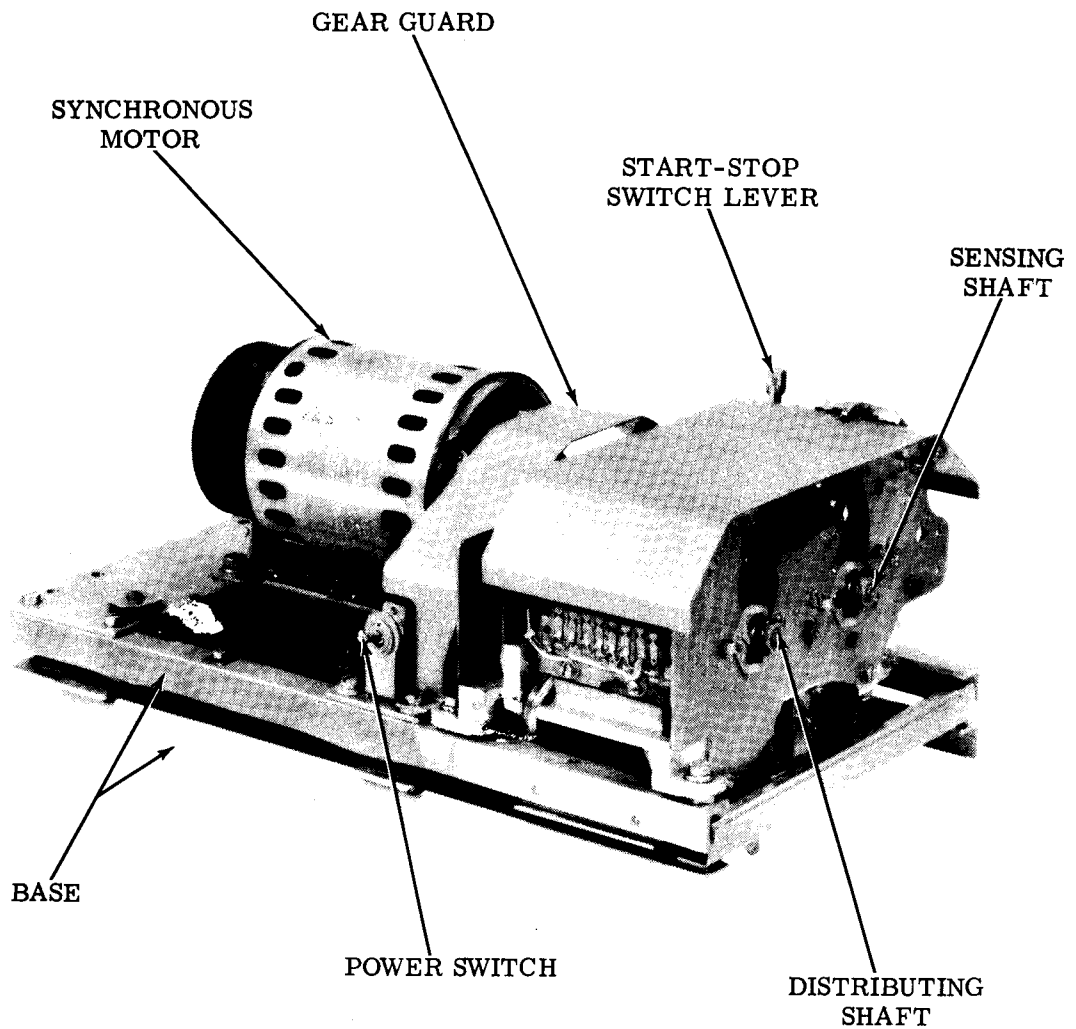
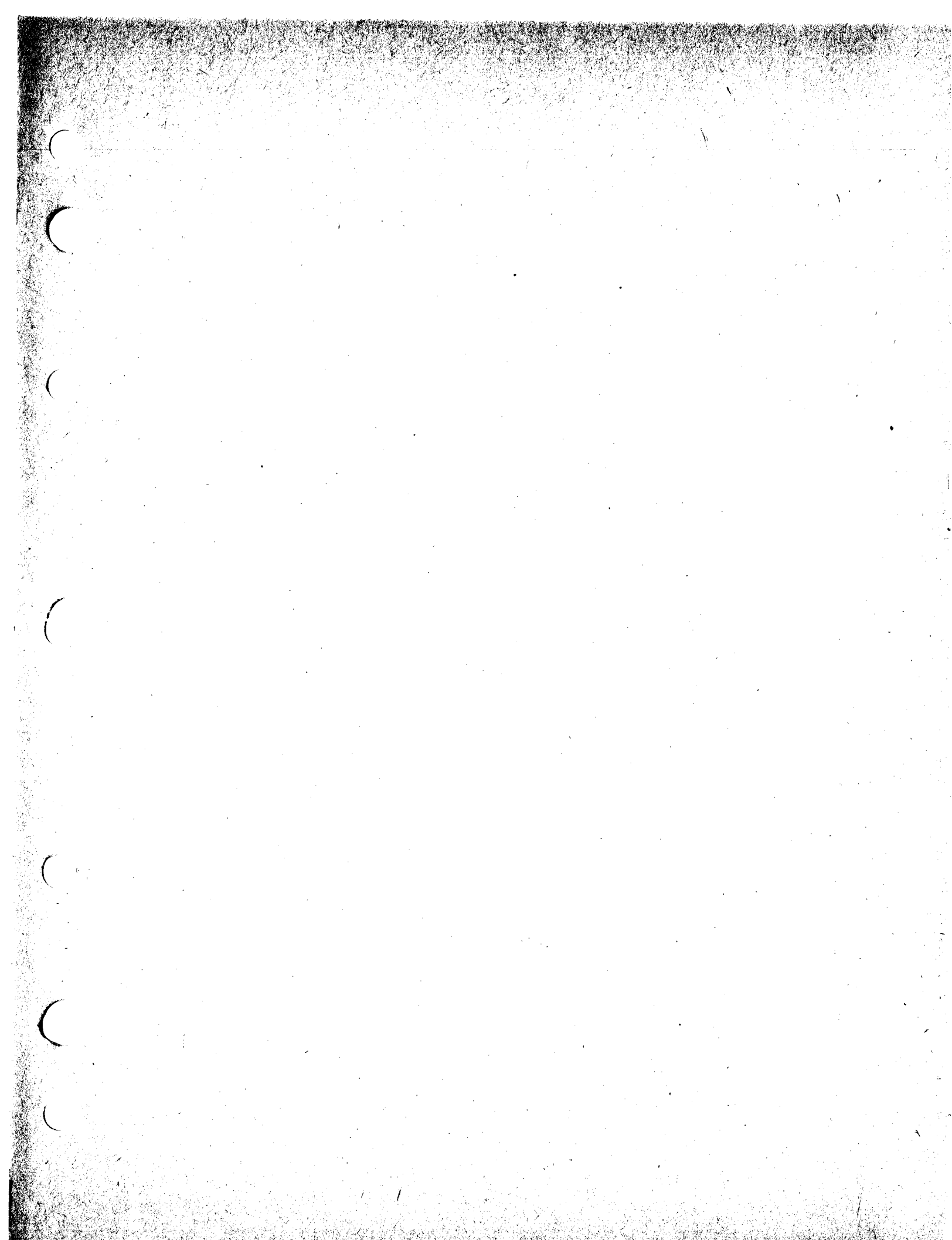
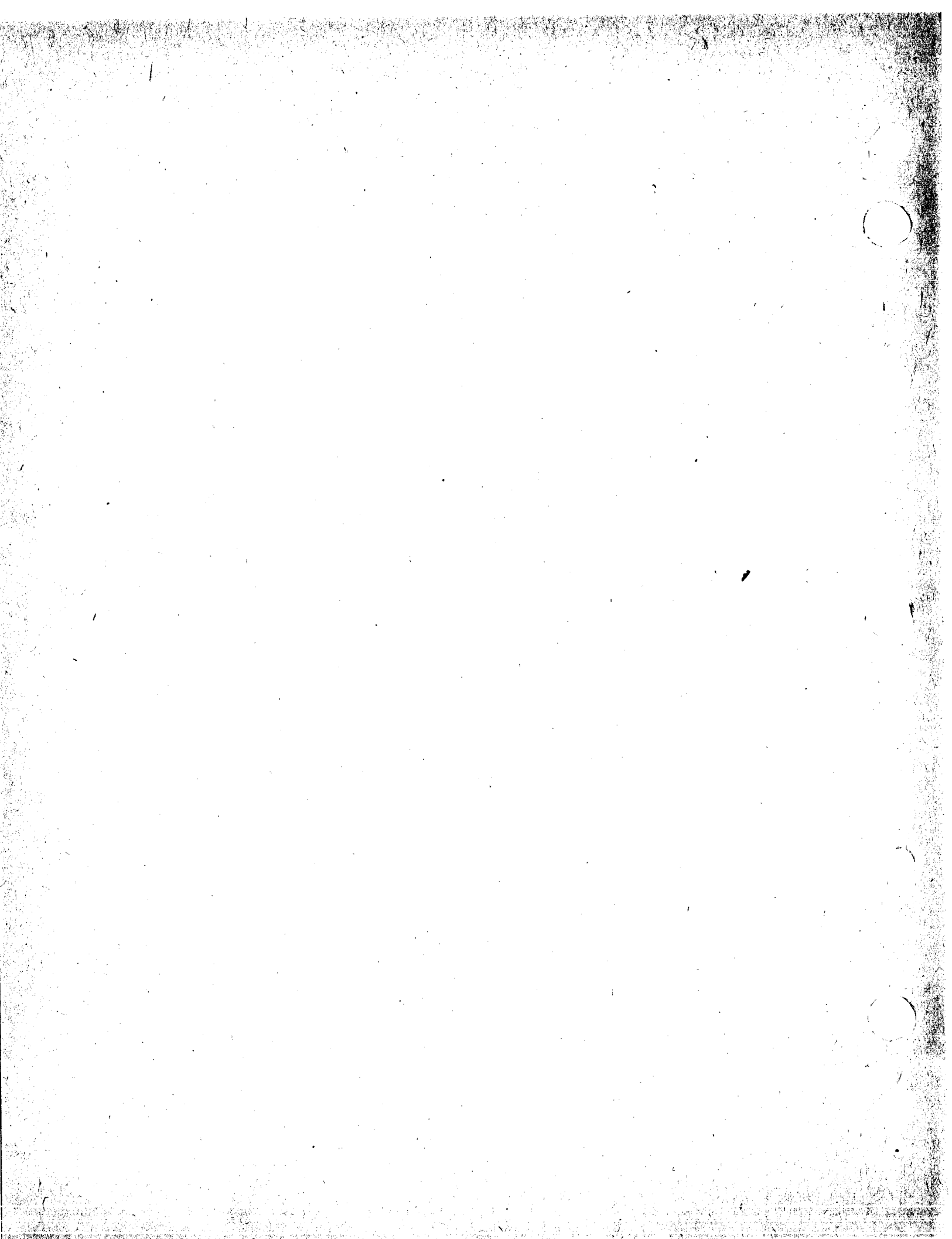


Figure 6 - 28 Transmitter Distributor Set (Multicontact — Cover Removed)





28 TRANSMITTER DISTRIBUTOR UNIT (LXD)
 DESCRIPTION AND PRINCIPLES OF OPERATION

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1. GENERAL	1	8. TAPE CONDITIONS	19
2. FUNCTION AND CONFIGURATION . .	3	TIGHT OR TANGLED TAPE.	19
FUNCTION	3	TAPE-OUT SENSING PIN	20
CONFIGURATION.	3	1. GENERAL	
ELECTRICAL CIRCUITS.	3	1.01 This section provides the description and principles of operation for the 5- and 6-level 28 transmitter distributor unit (single contact).	
A. Control Circuits	5	1.02 All references in text to left or right, front or rear, up or down are made from a position in front of, and facing the unit.	
B. Signal Circuit	9	1.03 The single contact 28 transmitter distributor unit (Figure 1) is an electromechanical device, which reads code combinations perforated in tape, translates these combinations into electrical impulses, and transmits them in the form of a 5- or 6-level, start-stop permutation code to one or more receiving stations.	
3. TECHNICAL DATA.	9	1.04 The unit can be used as a component in a self-contained set, in an Automatic Send-Receive Set (ASR), or in a gang-mounted arrangement.	
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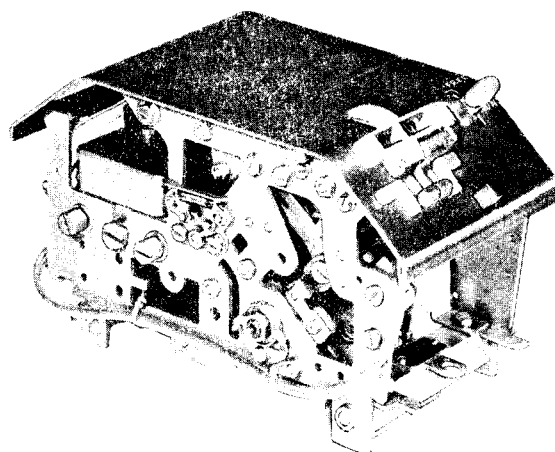


Figure 1 - Typical 5-Level Transmitter Distributor Unit

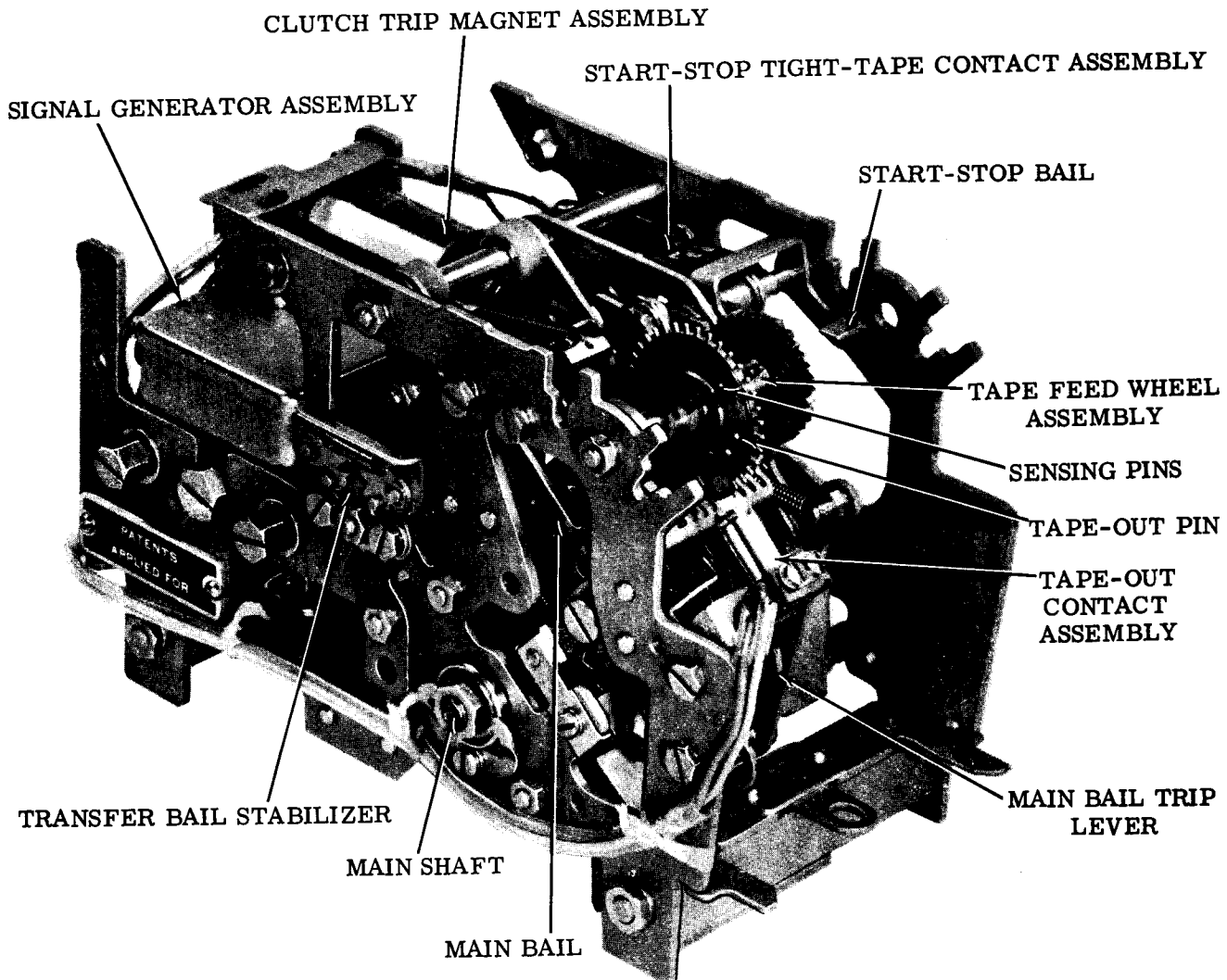


Figure 2 - Transmitter Distributor Unit (Cover Plate, Top Plate and Tape Guideplate Removed)

1.05 The transmitter distributor uses a single camshaft to start, and sequentially perform, the functions of sensing the intelligence stored in a perforated tape. An electrical contact is linked to certain mechanisms to translate the intelligence sensed into pulses of current (marking) and no current (spacing). The unit accepts either chadless or fully perforated tape (Figure 4).

1.06 The signal generator assembly (Figure 12) includes a contact toggle assembly, a drive link, a cover, and an eccentric for adjusting the signal contacts. The signal contacts may be made of either tungsten or gold-plated tungsten.

Note: Gold-plated contacts may be used for both standard applications (including those with data sets) and special low-level applications. However, once used for standard application, they may not be suitable for special low-level application.

2. FUNCTION AND CONFIGURATION

FUNCTION

2.01 The basic operation of the transmitter distributor is to mechanically sense perforated tape and transfer the information to the signal generator, which performs the actual signal transmission (Figure 2).

2.02 The transmitter distributor can be thought of as having two basic functions. The transmitter (tape reader) senses or reads the punched code combinations in the tape and transfers this data mechanically to the distributor. The distributor (signal generator) converts the parallel signal from the transmitter into sequential, start-stop signals for distribution on line.

CONFIGURATION

2.03 The following operating mechanisms of the transmitter distributor are contained between three parallel plates.

(a) The tape sensing mechanism which consists of a bank of sensing pins, (5 or 6 depending on the code level) each with its corresponding transfer lever and latch lever (Figures 2 and 3).

(b) The main shaft assembly, (Figures 2 and 3) which is centrally located in the lower portion of the unit, has the outer race of each

ball bearing clamped to the respective front and rear plates. The main shaft assembly consists of multiple cams, eccentrics, and a clutch. Motor power to the shaft is obtained from an external source and is controlled by the clutch and the clutch trip magnet assembly.

(c) A tape feed mechanism that accommodates either chadless or fully perforated tape.

(d) A tape-out pin (Figure 2), located to the right of the sensing pins, stops transmission if there is no tape in the sensing head (Figure 5).

(e) A quick disconnect 36-pin terminal or plug which aligns with its mate on a base, facilitates making electrical connections (Figure 3).

(f) A nylon insulating screw is mounted on the connector bracket and adjusted to align with, and actuate the "Line Shunt Switch" on the associated base (Figure 3).

2.04 The tape lid has the following components:

(a) A three-position control lever for manual control of the unit. The lever positions are FREE, STOP, and RUN.

(b) A pair of adjustable guides (Figure 5) for aligning and locating 11/16- or 7/8-inch wide tape over the feed wheel. An index line is scored in the tape guides 0.600 inch (6 characters) ahead of the sensing pins to aid in aligning the tape.

(c) A tight-tape device on the tape lid stops transmission if the tape becomes taut or tangled.

(d) A spring-loaded tape lid (Figure 5) that snaps open when the red tape lid release plunger is depressed.

ELECTRICAL CIRCUITS

2.05 The transmitter distributor has two electrical circuits, the clutch trip magnet circuit and the signal circuit. The clutch trip magnet circuit consists of the clutch trip magnet coils which are in series with the tape-out, start-stop, and tight-tape contact assemblies. The signal circuit consists of the transmitter signal generator contacts wired to provide neutral operation.

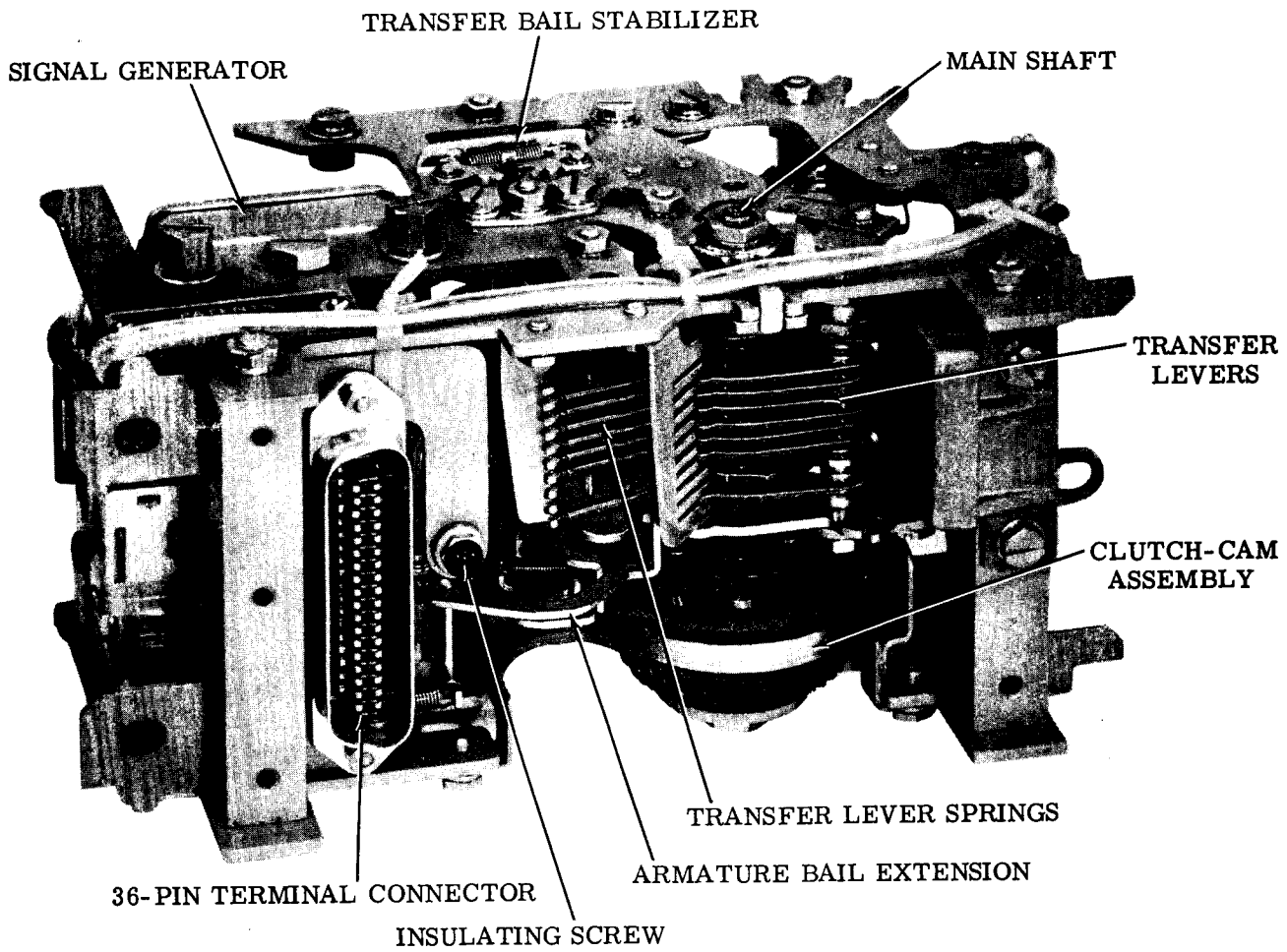


Figure 3 - Transmitter Distributor Unit (Bottom View)

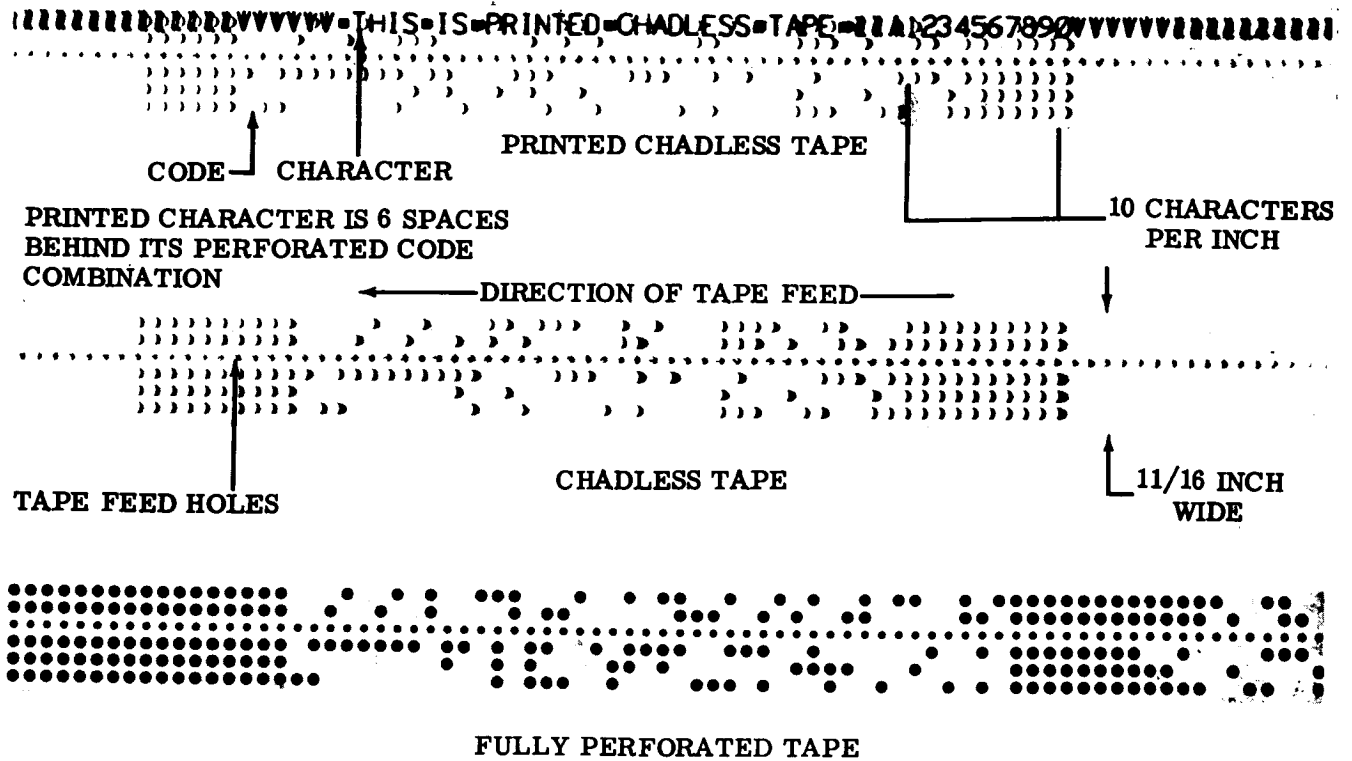


Figure 4 - Standard 5-Level Perforated Tapes

A. Control Circuits

2.06 The control circuit (clutch trip magnet) operates from the following power sources:

- (a) 115 v ac $\pm 10\%$ 60 cycles.
- (b) 120 v dc $\pm 10\%$ with suitable external resistance.
- (c) 50 v dc $\pm 10\%$ with suitable external resistance.

2.07 The tight-tape, tape-out, and manual control mechanisms operate contact assemblies which are in series with the clutch trip magnet assembly. Actuation of any one of these devices opens the clutch trip magnet circuit, causing the clutch to become disengaged, and the transmitter to go into an idle line condition.

Note: Overload protection must be provided externally to the unit.

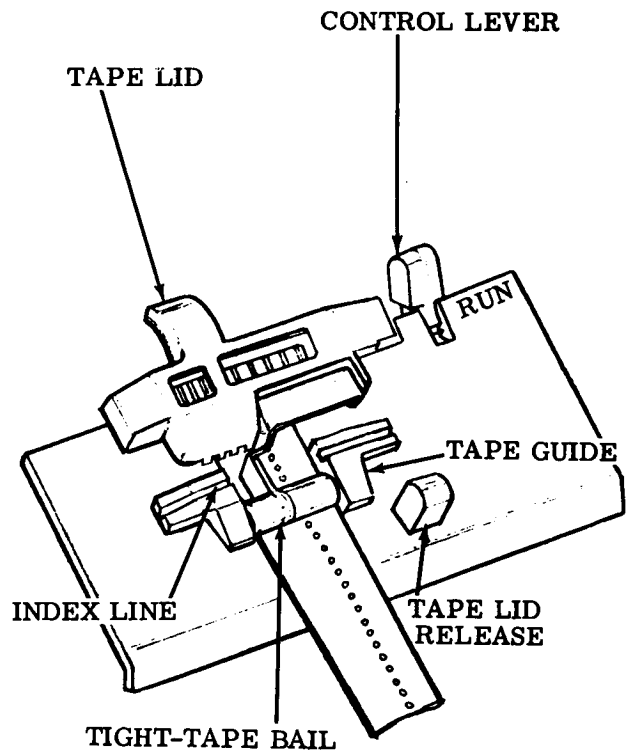
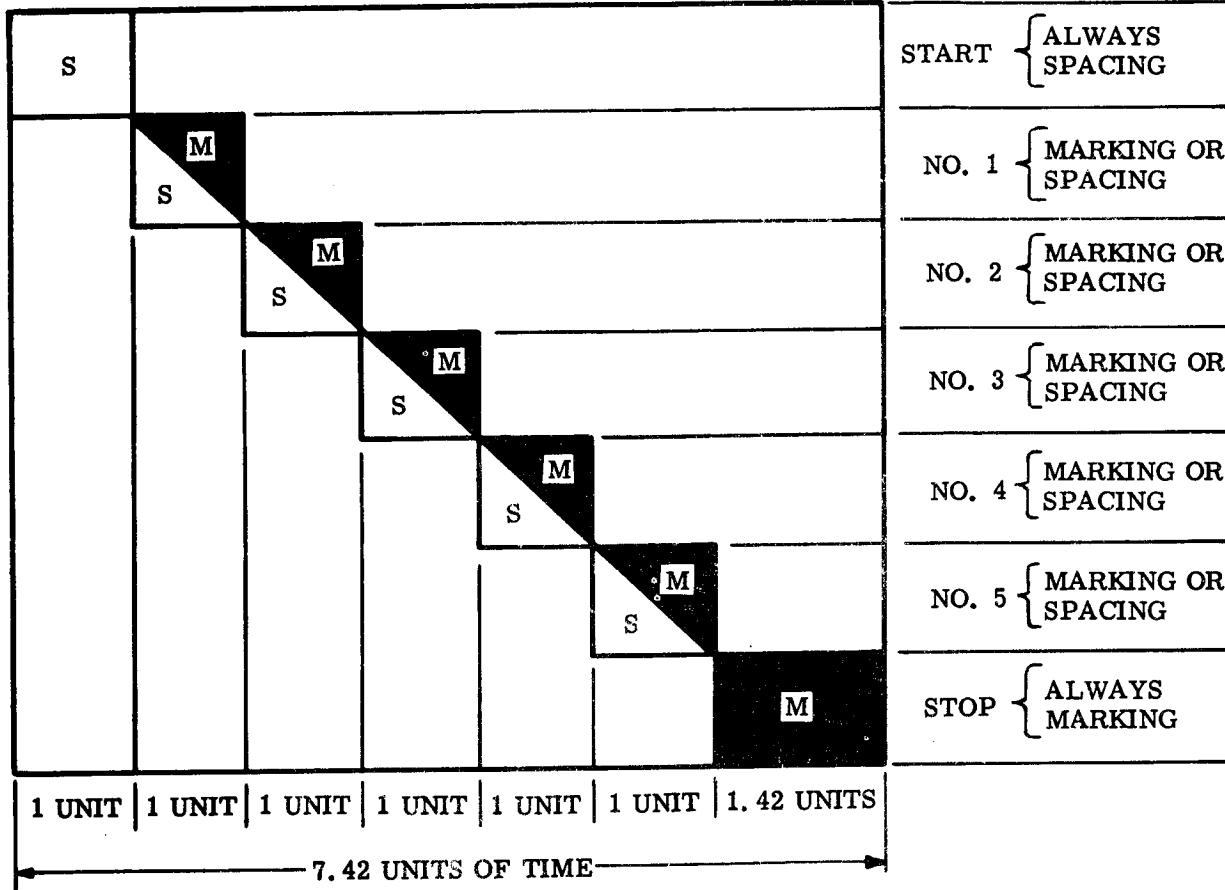
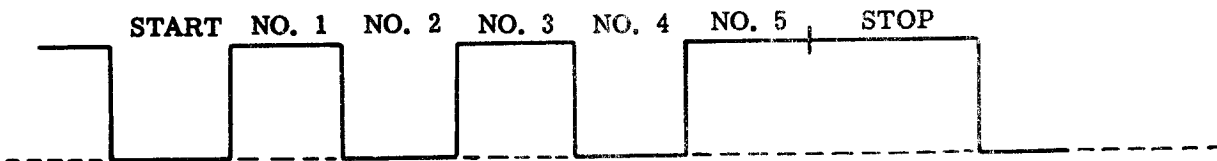


Figure 5 - Tape Guideplate

TRANSMISSION SEQUENCE



SIGNALING CODE



GRAPHIC REPRESENTATION OF LETTER "Y"

FIGURES	-	?	:	\$	3	!	8	#	8	'	()	.	,	9	0	1	4	0	5	7	;	2	/	6	"	2	<	≡	■	▼	▲		
LETTERS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	BLANK	C.R.	L.F.	SPACE	L.T.R.	FIG.		
1	○	○		○	○					○	○					○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
2	○		○				○		○	○	○	○				○	○	○					○	○	○				○			○	○	
FEEB HOLES	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
3			○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				○			○	○
4	○	○	○		○	○			○	○	○	○	○	○	○		○					○	○	○									○	○
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CODE HOLE COMBINATIONS OF TYPICAL CHARACTER ARRANGEMENT

Figure 6 - Start-Stop Signaling Code

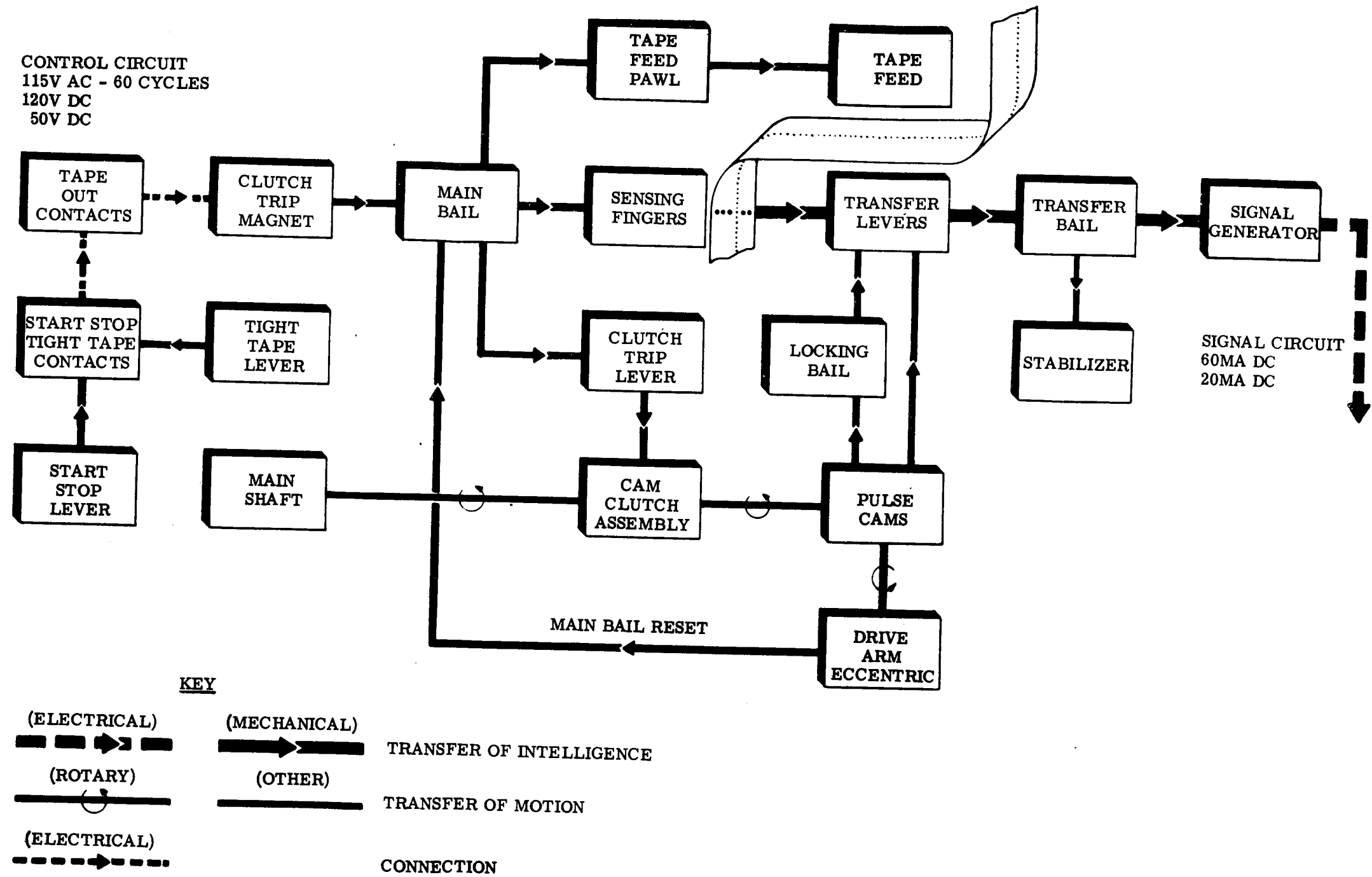


Figure 7 - Functional Block Diagram of Transmitter Distributor Unit

