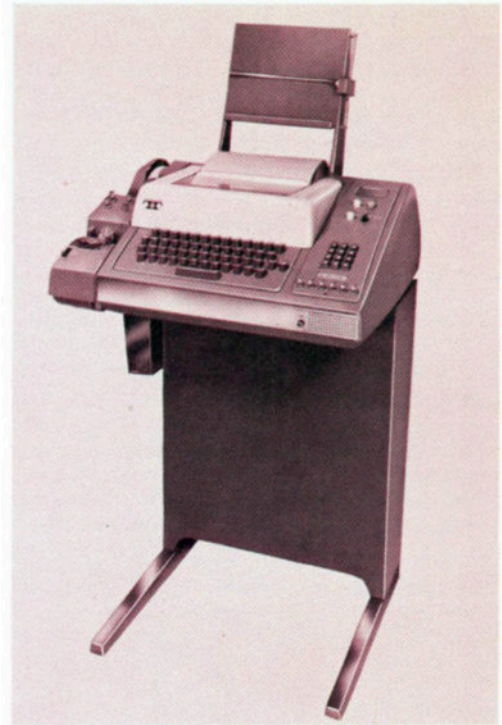**ШШ**
western union

Model 33 KSR

Model 33 ASR

FEATURES

- Transmits or Receives Half Duplex
- Unattended Operation (Receiving Incoming Calls Only)
- Automatic Motor Control
- Direct Dialing of Distant Stations
- Unique Multi-Character Answer-back
- Automatic Identification of Distant Station
- Verification that Distant Station is Operating
- Provides Single or Multiple Copy Permanent Record
- Friction Feed (Standard)
- Sprocket Feed (Optional)
- Continuous Paper Roll (Friction Feed)
- Fan Folded Form Paper (Sprocket Feed)
- Single or Double Line Spacing (Set by Maintainer)
- End-of-Line Indicator
- 1963 or 1968 ASCII Code
- Parity Keyboard (Optional)
- Conference Calls
- Collect Calls

- Capable of Communicating with International Telex
- Off-Line Preparation of Tape (ASR Only)
- Duplicates Previously Prepared Tape (ASR Only) (Operator's Option)
- Prepares Tape of Incoming Messages (ASR Only) (Operator's Option)
- Transmits Previously Prepared Tape (ASR Only)
- Continuous Tape Operation (ASR Only)
- Easy to Operate
- Low Cost, Light Duty
- Copy Holder with Line Guide
- Keyboard Similar to Standard Typewriter
- Low Paper Indicator
- Loudspeaker Monitors Call Progress Tones
- Automatic Control of Tape Reader (ASR Only) (Optional)
- Automatic Card Dialing (Optional)

GENERAL DESCRIPTION

The Model 33 TWX Sets are economical, light duty units used by subscribers of the Western Union TWX network to communicate directly on a dial-up, point-to-point connection with other subscribers of the TWX network. The units are self-contained, requiring only a data set, which is normally mounted within the pedestal of the Model 33. The data set converts the eight-level ASCII code start-stop signals generated by the Model 33 into tone frequencies suitable for transmission over the communications facility.

Either a rotary type dial or a pushbutton tone dial is provided to make the connection to the called subscriber. The type of dialing,

either rotary or pushbutton tone, is dependent on the service capabilities in the subscribers area and, therefore, not selectable by the new subscriber.

All Model 33 TWX sets are capable of unattended operation in the receiving mode. An answer-back unit incorporated within each set is coded uniquely with the subscribers identification. When an incoming call is received, the motor at the called station is turned on automatically, and the unique answer-back identification is sent back to the calling station. The calling station, on receiving the answer-back, is thus able to determine that it has reached the cor-

rect subscriber. The calling station may then proceed to send the message. After the message has been sent, the calling station normally transmits its own answer-back identification, then disconnects, and both stations are returned to the idle condition.

The Model 33 TWX sets are of three basic types: the KSR (keyboard send-receive), the ASR (automatic send-receive), and the RO (receiving only). Each set serves a particular application. The following paragraphs provide a general description of each set.

The Model 33 KSR set (illustrated on the first page) utilizes a keyboard similar to a standard typewriter for originating and sending messages. The call control unit mounted to the right of the keyboard contains the dial mechanism and pushbutton indicator switches necessary to originate and complete a call to another subscriber. Additional pushbutton indicator switches are provided for various control functions. A loudspeaker allows the operator to listen to the various call progress tones (ring, busy number, busy circuit, etc.), during the connection procedure.

The typing unit functions in all modes of operation to produce a printed copy of the message either being sent or received, and also in the local mode, where the keyboard is used but signals are not sent to the communication lines. Printed copy is always produced in capital letters by the typing unit. If the Model 33 is receiving transmission from a source capable of generating the dual case (upper and lower case alphabet) 1968 ASCII code, the lower case letters are automatically converted to the equivalent capital letters.

The Model 33 KSR is supplied with a standard friction feed typing unit. As optional equipment, the set can be supplied with a sprocket feed typing unit. With sprocket feed, special form paper is available in standard sizes and a form feed out feature is available to automatically position the paper at the top line of each form for the start of a new message.

The Model 33 ASR Set (illustrated on the first page) incorporates all of the features of the Model 33 KSR and additionally incorporates a paper tape punch and tape reader. Paper tape is prepared (punched) by the mechanical action of striking the keys of the keyboard. Paper tape may be prepared off-line (local mode) for later transmission. Paper tape may also be punched on incoming messages, if desired, or if a tape has previously been prepared, a duplicate tape can be prepared when the original tape is being processed by the local tape reader.

The tape reader is used to transmit messages from tape previously prepared by the tape punch. Associated controls are used to start and stop the tape reader. Additional control functions are available for control of the tape reader. These are discussed separately in this data sheet under the heading "Optional Features and Accessory Equipment."

The Model 33 RO is similar to the Model 33 KSR but is limited to receiving messages only. The keyboard is not included on this unit and the dial mechanism is absent from the call control unit. The 33 RO's are used as extension units and may be located either in the same building or in a different building from the main set. A data set, type 101, is required when the RO is located at distances greater than 1000 feet from the main unit or in another building. Friction feed is standard on an RO; however, sprocket feed and fan-folded forms may be used optionally.

The Model 33 Sets utilize the American Standard Code for Information Interchange, commonly referred to as the ASCII code. This is a seven-bit code with an eighth bit added in the Model 33 for an optional even-parity check. (If the even-parity option is not used, the eighth bit is always marking.) The use of seven bits to represent each character provides a total of 128 available permutations (unique combinations of zeros and ones) for character assignments. In the 1968 version of the ASCII code, 95 of these permutations are assigned to printing characters (graphics) and 32 are assigned to non-printing control functions. (The DELETE character is neither a graphic nor a control.)

The original ASCII code was introduced in 1963 and contained 64 graphics (including the space between words, which is normally non-printing) and 32 control functions. This version assigned permutations to the upper case alphabet only. In 1967, the code was revised to include the lower case of the alphabet and also to incorporate other changes to make the code more useful for both communications and data processing. All of the graphics used in both the Cobol and Fortran programming languages were included in the revised code. Additional changes were made to achieve compatibility with an international standard 7-bit code.

Minor changes in the text of the code standard were made in 1968, but the code table in the 1968 version is identical to the 1967 code table. The 1963 and 1967/1968 ASCII codes are shown combined in the chart below.

ASCII CHART

ROW	BIT 4	BIT 3	BIT 2	BIT 1	0 (63)	0 (67)	1 (63)	1 (67)	2 (63)	2 (67)	3 (63)	3 (67)	4 (63)	4 (67)	5 (63)	5 (67)	6 (63)	6 (67)	7 (63)	7 (67)
					COLUMN → 0		1		2		3		4		5		6		7	
					BIT 7 0		0		0		0		1		1		1		1	
					BIT 6 0		0		1		1		0		0		1		1	
					BIT 5 0		1		0		1		0		1		0		1	
0	0	0	0	0	NULL	NUL	DC0	DLE	SP		0		@		P		↑ UNASSIGNED	`	↑ UNASSIGNED	p
1	0	0	0	1	SOM	SOH	DC1		!		1		A		Q			a		q
2	0	0	1	0	EOA	STX	DC2		"		2		B		R			b		r
3	0	0	1	1	EOM	ETX	DC3		#		3		C		S			c		s
4	0	1	0	0	EOT		DC4 STOP	DC4	$		4		D		T			d		t
5	0	1	0	1	WRU	ENQ	ERR	NAK	%		5		E		U			e		u
6	0	1	1	0	RU	ACK	SYNC	SYN	&		6		F		V			f		v
7	0	1	1	1	BELL	BEL	LEM	ETB	'		7		G		W			g		w
8	1	0	0	0	FE_0	BS	S_0	CAN	(		8		H		X			h		x
9	1	0	0	1	HT		S_1	EM	)		9		I		Y			i		y
10	1	0	1	0	LF		S_2	SUB	*		:		J		Z			j		z
11	1	0	1	1	VT		S_3	ESC	+		;		K		[			k		{
12	1	1	0	0	FF		S_4	FS	,		<		L		\			l	ACK	|
13	1	1	0	1	CR		S_5	GS	-		=		M		]			m	Φ	}
14	1	1	1	0	SO		S_6	RS	.		>		N		↑	^		n	ESC	~
15	1	1	1	1	SI		S_7	US	/		?		O		←	_		o	DEL	

(Heading row labels: COLUMN, BIT 7, BIT 6, BIT 5 across the top; ROW, BIT 4, BIT 3, BIT 2, BIT 1 down the side; the CHARACTERS* block lists 63 and 67 sub-columns for each COLUMN 0–7.)

* THE CHARACTERS LISTED BELOW REFLECT THE DIFFERENCES (IF ANY) BETWEEN THE ORIGINAL (1963) AND THE REVISED (1967 AND 1968) ASCII CODE. WHERE ONLY ONE CHARACTER IS LISTED, THE CODE HAS REMAINED THE SAME.
NOTE: 1968 IS IDENTICAL TO 1967 AND IS NOT SHOWN.

The Model 33 Sets may be equipped with either a 1963 or a 1968 ASCII version of the keyboard. However, the Model 33 Sets are monocase units, capable of transmitting and receiving only the upper case alphabet. If a Model 33 Set is receiving transmission from a device capable of transmitting the 1968 ASCII, the lower case alphabet and other graphics assigned to columns 6 and 7 of the 1968 code table are converted to their corresponding counterparts in columns 4 and 5.

PHYSICAL DESCRIPTION

The Model 33 KSR consists of a teletypewriter mounted on a pedestal unit. The pedestal unit is designed to allow a chair to be placed in position inside the pedestal feet at a convenient typing height for the operator. The data set associated with each Model 33 KSR is housed completely within the enclosed pedestal. The overall finish is a light olive gray enamel.

The keyboard is similar to a standard typewriter keyboard. It contains four rows of keys and a space bar immediately below the bottom row of keys. In addition to the normal alpha-numeric keys, there are special control keys on the keyboard. Refer to the paragraph "Operating Controls and Indicators" for specific information on these special keys.

The typing unit, concealed underneath a protective lid, includes the movable carriage and typewheel, ribbon mechanism, and associated mechanical elements for performing the typing function. In response to either keyboard action or incoming signals, the typewheel is positioned rotationally and vertically to place the proper character in position. A printing hammer then drives the typewheel along with an inked ribbon against the paper to reproduce the selected character on the paper. The typing lid contains a windowed area for viewing the printed copy and also serves as a cutting edge for tearing off the paper at a convenient point. The typing lid can easily be opened for changing ribbons and installing new paper rolls or form paper.

The rear portion of the typing lid supports the paper feed spindle and also contains the slots for mounting the copy holder. The copy holder and associated line guide accommodate page copy approximately 8 inches in length.

The call control unit is conveniently mounted at the right-hand side of the keyboard. This unit incorporates the dial mechanism (rotary or pushbutton tone), associated switches and indicators for establishing the various modes of operation and a loudspeaker for monitoring the call progress tones. The six pushbutton indicators immediately below the dial mechanism are related to placing a call and mode selection. Immediately below, a decorative grille allows the tones of the loudspeaker to be heard. An associated volume control is also mounted on the grille surface. The remaining four switches and indicators above the dial mechanism are for special functions. Each of the pushbutton indicators is discussed separately in the paragraph titled "Operating Controls and Indicators."

The ASR set is identical to the KSR but has the additional tape punch and tape reader units. Both of these units are located to the left-hand side of the keyboard, with the tape punch mounted behind the tape reader.

The tape punch contains four pushbuttons for manually controlling tape punch operation. A chad container mounted directly beneath collects the chads from the fully perforated one-inch wide paper tape.

The tape reader, which reads the code punched in the fully perforated tape, contains a tape guide mechanism and a lever type slide switch. The tape guide mechanism contains a clamping device that raises to allow threading and lowers to securely hold the threaded tape in place. The lever switch which controls tape operation has START, STOP, and FREE positions.

OPERATING CONTROLS AND INDICATORS

Keyboard

The Model 33 KSR and ASR keyboards are identical. There is a difference, however, between the 1963 ASCII keyboard and the 1968 ASCII keyboard. A keyboard illustration for each of these two types is shown above, right. An explanation of the various control keys found on the keyboards is contained in the accompanying table. Model 33 KSR and ASR keyboards are available with or without parity generation. The sets are not capable of checking parity. When a parity keyboard is used, the code for any character always contains an even number of marking pulses with the eighth bit being the parity check bit. The parity option is useful when the Model 33 is used in a system where a computer or other equipment checks parity. When the parity option is not used, the eighth bit is always marking.
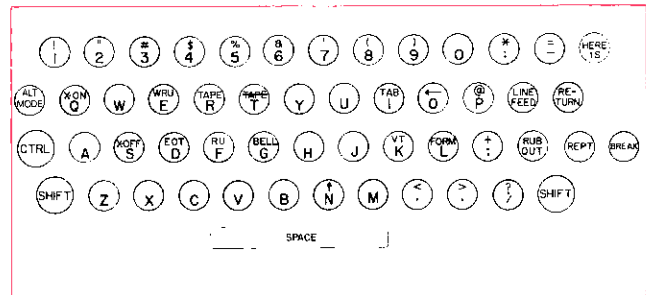
1963 ASCII Keyboard
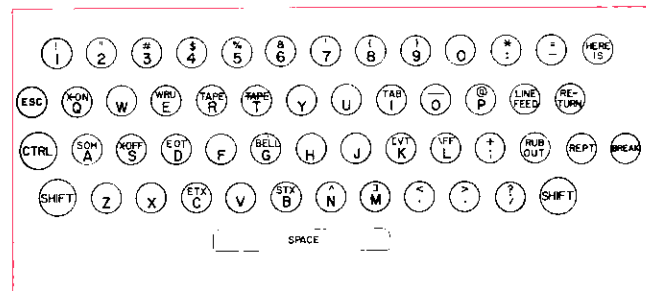
1968 ASCII Keyboard

SPECIAL KEYBOARD KEYS

Key Designation	Function
HERE IS	Triggers the automatic answer back identification at the local station.
WRU (Who Are You)	Generates a signal request for identification of the distant station.
LINE FEED	Moves the paper up one or two lines, according to the line space setting.
RETURN	Returns the carriage to the left margin.
REPT (Repeat)	Used to repeat a character. The REPT key is held depressed while the desired character is depressed once.
SHIFT	Depressed to type symbols which appear on the upper portion of the keytops. The SHIFT key is non-locking.
CTRL (Control)	Depressed to generate the non-printing control characters designated on certain keytops. The CTRL key is non-locking.
BREAK	Depressed whenever it is necessary to interrupt a sending station or signal the TWX Assistance Operator on a call placed with her.
RUBOUT (Delete)	Depressed after each operation of the RETURN and LINE FEED keys to begin each new line of typing. Also used as a delete character for correcting errors in tape.
TAPE *	Used to turn on the tape perforator at the receiving station.
~~TAPE~~ *	Used to turn off the tape perforator at the distant station.
BELL	Used to signal the attendant at the distant station.
TAB	Used for horizontal tabulation when sending to stations that have tabulation capabilities.

SPECIAL KEYBOARD KEYS (cont.)

*X-ON (Transmitter On)	Starts the distant station's tape reader.
*X-OFF (Transmitter Off)	When punched in tape, this code stops the local tape reader.
EOT (End of Transmission)	Used for instantaneous disconnect when transmitted from perforated tape or the keyboard on direct dialed calls.
*FORM	This function is used to feed out the remaining form to the first typing line of the next form.
VT (Vertical Tabulation)	Used for vertical tabulation when sending to stations that have tabulation capabilities.
ESC (Escape)	Non-functional key intended for future use.
ETX (End of Text)**	When this key is used, specific instructions will be given for its use.
STX (Start of Text)**	When this key is used, specific instructions will be given for its use.
SOH (Start of Header)**	When this key is used, specific instructions will be given for its use.

*These keys are functional only when specific options are elected. Refer to "Optional Features and Accessory Equipment" appearing later in this data sheet.

**These key designations are included on the 1968 ASCII keyboards only.

Call Control Unit

This unit contains the switches and indicators necessary to make the connection to the distant subscriber and also to control the mode of operation of the ASR or KSR set. The various switches and indicators are described in the following table and shown in the accompanying figure:

Call Control Unit

CALL CONTROL UNIT SWITCHES AND INDICATORS

Switch or Indicator	Function
ORIG (Originate) Pushbutton Indicator	Depressed to place the station in an off-hook condition to obtain a dial tone prior to dialing a number.
CLR (Clear) Pushbutton Indicator	Depressed to disconnect at the end of a connection, or to return the station to normal from any other mode.
ANS (Answer) Pushbutton Indicator	The lamp flashes to indicate an incoming call, and the bell rings if the station is in the local mode. The ANS pushbutton must be depressed to enable the station to answer the call when the station is in the local mode or in the out-of-service mode.
TST (Test) Pushbutton Indicator	Used for maintenance purposes.

CALL CONTROL UNIT SWITCHES AND INDICATORS (cont.)

LCL (Local) Pushbutton Indicator	Depressed to place the station in a local mode for off-line work, such as practicing typing or perforating tape.
BUZ-RLS (Buzzer-Release) Pushbutton Indicator	If paper supply is low, buzzer sounds and lamp lights. The pushbutton is depressed to silence buzzer; light goes out when fresh supply of paper is inserted and CLR pushbutton is depressed.
Dial Mechanism	Either a rotary or pushbutton type for dialing unique 10-digit number of distant subscriber.
NORMAL-RESTORE Switch	The station is taken out of service while replacing paper or ribbon. This is done by turning the NORMAL-RESTORE switch so the arrow points to the OUT-OF-SVC indicator. To restore the station to service, turn and hold the NORMAL-RESTORE switch to the RESTORE position until a dial tone is present, then permit the switch to return to NORMAL.
OUT-OF-SVC (Out of Service) Indicator	Lights when NORMAL-RESTORE switch is pointed toward indicator.
BRK-RLS (Break Release) Pushbutton Indicator	Depressed to allow transmission to resume after a BREAK signal has been received.
REST (Restrain) Indicator	Lights whenever the sending speed exceeds the permissible limit while communicating with a TWX station of slower speed.
LOUDSPEAKER	Enables monitoring of call progress tones during connection. The standard telephone-type tones such as: dial tone, busy, audible ring, etc. can be heard.
Volume Control	A volume control is associated with the loudspeaker and permits volume adjustment.
Ringer Control	This is an adjusting lever located on the underside of the call control unit for adjusting the volume of the signal bell.

Tape Punch and Tape Reader

On Model 33 ASR Sets, the tape punch and tape reader contain several switches. These are shown in the figure and described briefly in the associated table.

Tape Punch - Tape Reader