

LSI-12 AND LSI-24 LINE  
STATUS INDICATOR  
IDENTIFICATION AND INSTALLATION

1. GENERAL

1.01 This Section furnishes the identification, ordering, installation and maintenance information for the Associated Instrument Manufacturing Corporation Line Status Indicators LSI-12 and LSI-24.

2. IDENTIFICATION

2.01 The LSI indicator (Exhibit 1) is available with capacities for monitoring 12 lines on the LSI-12 and 24 lines on the LSI-24. Both line sizes use the same size cabinet.

2.02 Overall dimensions: approximate measurements of the Line Status Indicators are as follows:

Approximately 5 inches wide by 5 inches high by 5 inches deep at the base tapered to 3 inches deep at the top.

2.03 Application: the LSI-12 and LSI-24 models of the Line Status Indicator, are intended for non-key systems which are capable of offering call pick-up service. It provides a means of visually determining line status - off hook or ringing - as well as providing common-audible without the use of key equipment or incandescent lamps. These Line Status Indicators are compatible with all types of PBX equipment except the Dimension Custom Telephone Set.

2.04 Power: power is furnished using a 2012B-50 transformer and a customer provided 117V/60Hz outlet not under control of a switch.

2.05 Line Status Indicator operation: the LSI-12 and LSI-24 indicator connects in series with the T and R leads of lines to be monitored and indicates the status of these lines. There is a Light Emitting Diode (LED) associated with each of the monitored lines. This LED is off when the line is idle, on when the line is off-hook and flashes at 20Hz rate when the line is ringing. In addition, a common audible tone inside the LSI will sound when any line being monitored is ringing. The 20Hz lamp rate and audible signal are activated only when ringing voltage is actually being applied; they are not activated during the silent intervals. Therefore, the LSI-12 and LSI-24 indicators will provide the same distinctive ringing patterns provided to stations in the DIMENSION PBX (CSS201).

2.06 When a ringing station is to be answered by someone other than the station user, the answering location can dial a call pick-up code. When the pick-up code is dialed, the call will be transferred to the attendants phone and the lamp associated with the attendants line will light but the other lamp will go out. In the case where more than one phone is being rung, the determination of which call is answered is made by seeing which LED stops flashing. If there are dial pulse phones in the group, the pulse will be indicated by the lamp but will be brighter and much faster than the ringing pulse.

2.07 These items may be ordered thru Western Electric Company via the Order Invoice Plan.

(Qty) Indicator, Line Status LSI-12 (Color)

(Qty) Indicator, Line Status LSI-24 (Color)

Order from:

The available colors are: beige (60), black (03), green (51), yellow (56), white (58), blue (62), red (53) and ivory (50).

Associated Instrument Mfg. Corp.  
2313 Brun Street  
Houston, Texas 77019

(Qty) Transformer, 2012B-50

4.02 Do not attempt any maintenance other than described in 4.01. If Line Status Indicator becomes defective, replace it with one known to be working properly and return defective indicator to the Western Electric Service Center for repair.

### 3. INSTALLATION

3.01 Terminate A25B connector cables on connector blocks as shown in Exhibits 2 and 3. Tip and ring polarity must be maintained when terminating line status indicator leads to incoming CO tips and rings. Lead assignments for LSI-12 unit are shown in Exhibit 4 on Connector -1. Connections for LSI-24 unit are shown in Exhibit 4 on Connections 1 and 2.

### 5. CIRCUIT DESCRIPTION

5.01 Each line entering the Line Status Indicator has its own isolated circuit to indicate the status. Each circuit consists of a light emitting diode and an optoelectronic photocoupler plus several other components that have a supportive role. (See Exhibit 5.)

3.02 Connect the transformer leads to connecting block as shown in Exhibit 4 using D station wire.

3.03 The audible tone is adjusted by turning the potentiometer that is mounted on the metal base of the LSI unit.

5.02 The LED is used to provide the indicating light for each line. The LED chosen by Associated Instrument Mfg. Corp. for use in the Line Status Indicator is red and has a typical forward voltage drop of 1.8 volts D.C. at 25 mA thus providing an average power dissipation of .045 watt.

NOTE: Avoid locating Line Status Indicator in direct sunlight or areas of high illumination.

5.03 The optoelectronic photocoupler is the main component in the ring detector portion of each circuit. It consists of a neon lamp coupled to a photoconductor. The neon lamp is connected across the tip and ring sides of the line. The talk signal, being either twenty-four or forty-eight volts, has no effect at all on the neon lamp. However, when the ringing signal is applied, the neon ionizes and light shines on the photoconductor changing the resistance from approximately two megohms to approximately two thousand ohms.

### 4. MAINTENANCE

4.01 Maintenance of the LSI-12 and LSI-24 Line Status Indicator is limited to the replacement of defective LED units and adjustment of the volume of the audible tone. The audible tone can be adjusted by turning the potentiometer that is mounted on the metal base of the LSI. The indicator lamps (LEDs) are mounted in sockets that permit replacement in the field. Replacement lamps can be ordered as follows:

(10) Indicator Lamp, LED

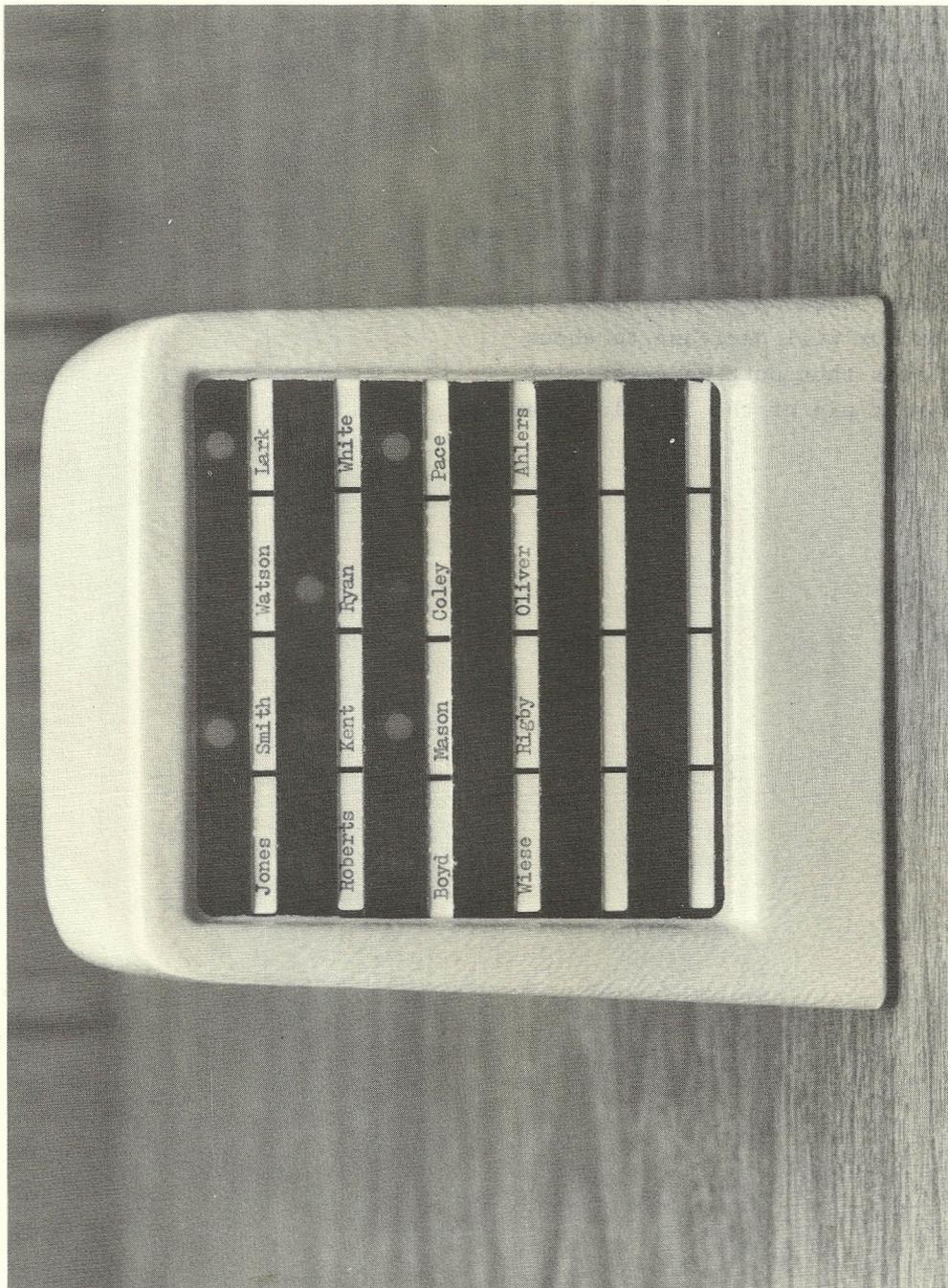
5.04 The photoconductors from each line, either twelve or twenty-four, are placed in parallel with each other, thus providing electrical isolation of the individual lines but still furnishing a common audible.

5.05 The tone itself is achieved by using a 555 clock as an astable multivibrator and using this to drive a small speaker. The photoconductive elements of the photocoupler are then connected between Vcc and the reset pin of the 555. (See Exhibit 6.)

5.06 The talk signal lights the LED but has no affect on the neon lamp. The ringing machine provides a high enough voltage across the neon lamp to induce breakdown and the lamp lights. When any of the lamps light, the photoconductor will decrease to about two thousand ohms thus putting a positive input on the rest pin of the 555 clock causing it to oscillate.

EXHIBIT 1

LSI-12 and LSI-24 Line Status Indicators



*W.L. Lawston / photography*

EXHIBIT 2

Method of Connecting Line Status Indicator Using 66-Type Blocks

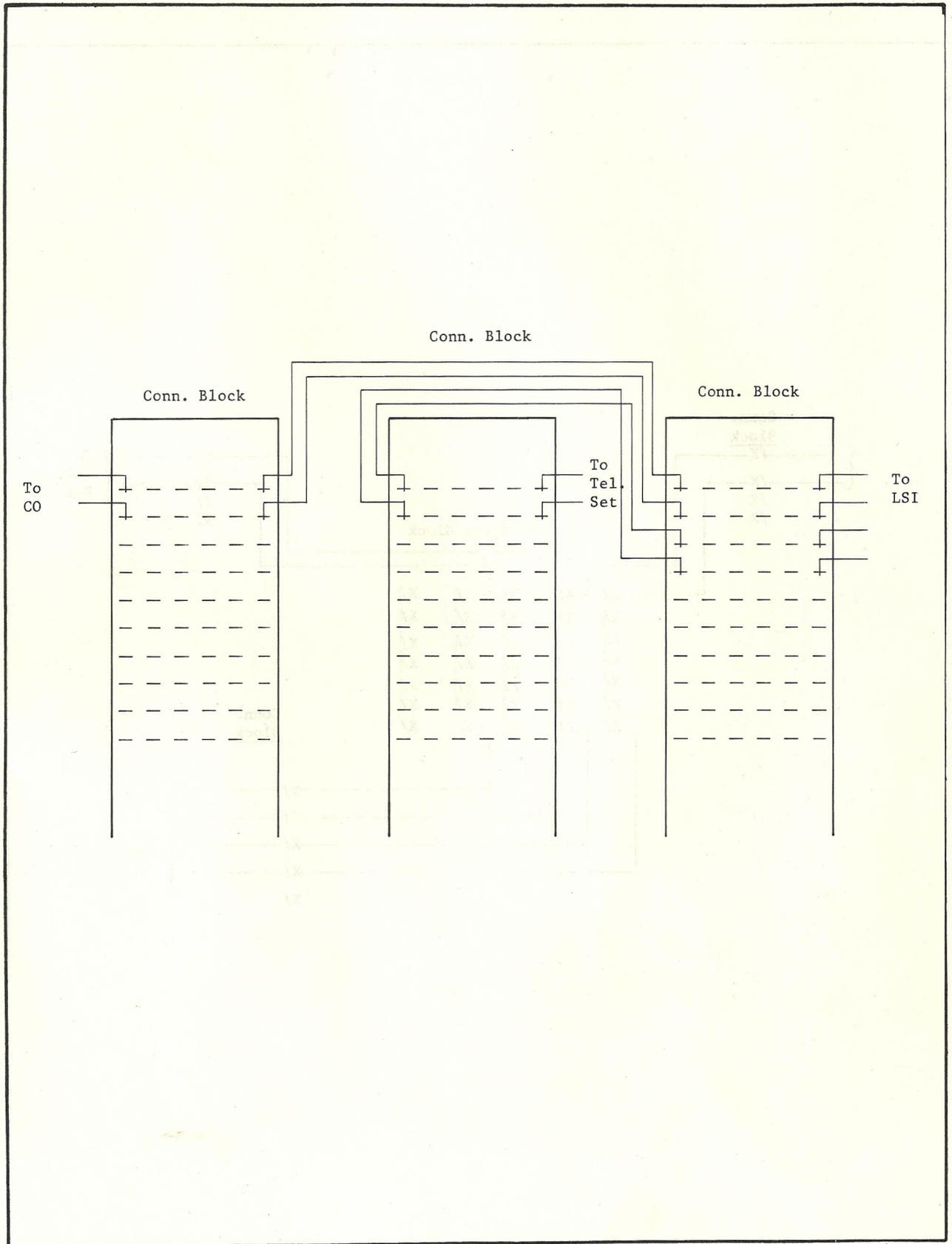
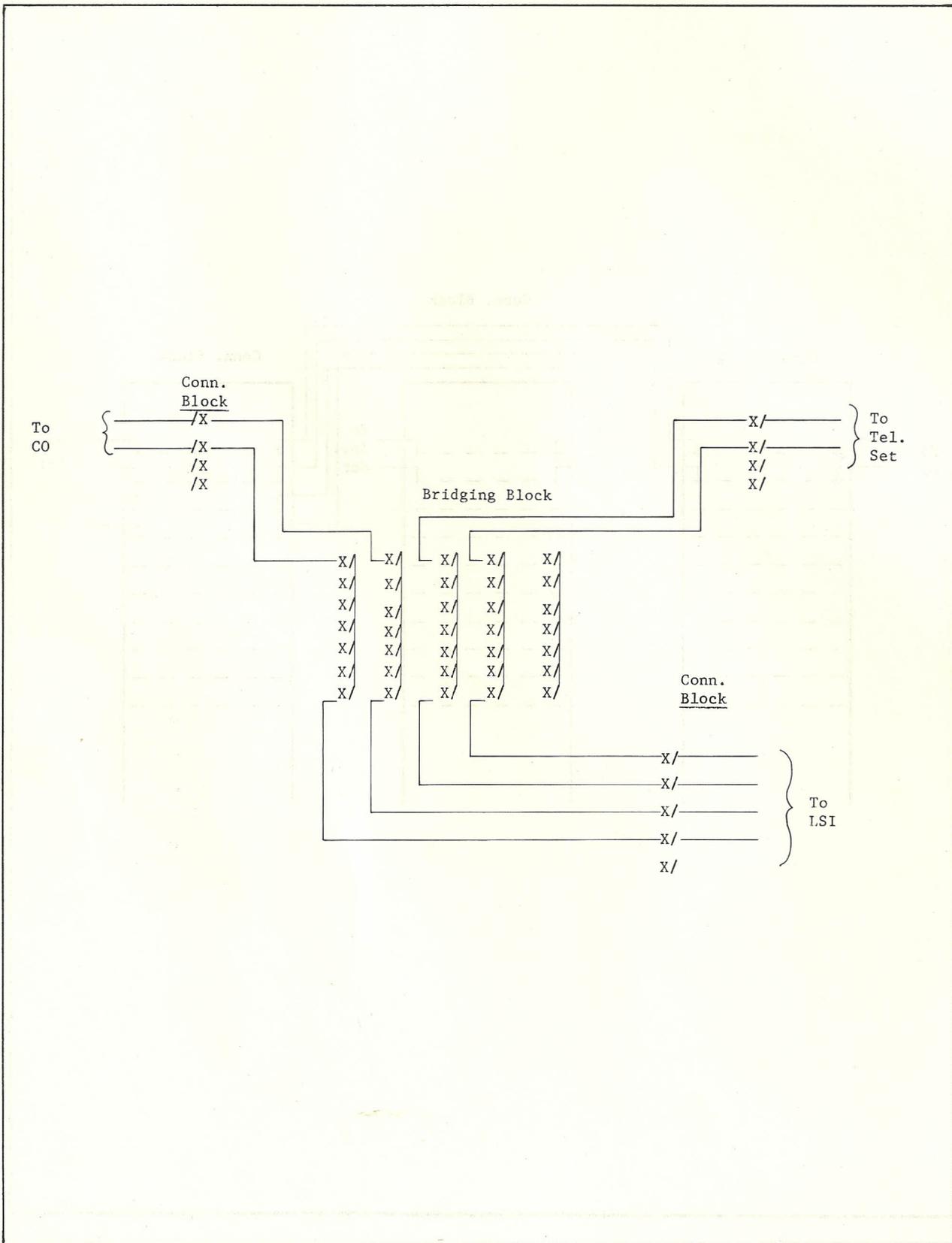


EXHIBIT 3

Method of Connecting Line Status Indicator Using 88-Type Blocks



## EXHIBIT 4

## CONNECTIONS FOR LSI-12 AND LSI-24 LINE STATUS INDICATORS

26	_____	T		26	_____	T	
1	_____	R		1	_____	R	
27	_____	T1	Line 1	27	_____	T1	Line 13
2	_____	R1		2	_____	R1	
28	_____	T		28	_____	T	
3	_____	R		3	_____	R	
29	_____	T1	Line 2	29	_____	T1	Line 14
4	_____	R1		4	_____	R1	
30	_____	T		30	_____	T	
5	_____	R		5	_____	R	
31	_____	T1	Line 3	31	_____	T1	Line 15
6	_____	R1		6	_____	R1	
32	_____	T		32	_____	T	
7	_____	R		7	_____	R	
33	_____	T1	Line 4	33	_____	T1	Line 16
8	_____	R1		8	_____	R1	
34	_____	T		34	_____	T	
9	_____	R		9	_____	R	
35	_____	T1	Line 5	35	_____	T1	Line 17
10	_____	R1		10	_____	R1	
36	_____	T		36	_____	T	
11	_____	R		11	_____	R	
37	_____	T1	Line 6	37	_____	T1	Line 18
12	_____	R1		12	_____	R1	
38	_____	T		38	_____	T	
13	_____	R		13	_____	R	
39	_____	T1	Line 7	39	_____	T1	Line 19
14	_____	R1		14	_____	R1	
40	_____	T		40	_____	T	
15	_____	R		15	_____	R	
41	_____	T1	Line 8	41	_____	T1	Line 20
16	_____	R1		16	_____	R1	
42	_____	T		42	_____	T	
17	_____	R		17	_____	R	
43	_____	T1	Line 9	43	_____	T1	Line 21
18	_____	R1		18	_____	R1	
44	_____	T		44	_____	T	
19	_____	R		19	_____	R	
45	_____	T1	Line 10	45	_____	T1	Line 22
20	_____	R1		20	_____	R1	
46	_____	T		46	_____	T	
21	_____	R		21	_____	R	
47	_____	T1	Line 11	47	_____	T1	Line 23
22	_____	R1		22	_____	R1	
48	_____	T		48	_____	T	
23	_____	R		23	_____	R	
49	_____	T1	Line 12	49	_____	T1	Line 24
24	_____	R1		24	_____	R1	
50	_____	AC1	To 2012B-50	50	_____		
25	_____	AC2	Transformer	25	_____		

CONNECTOR - 1

CONNECTOR - 2

EXHIBIT 5

LINE CIRCUIT

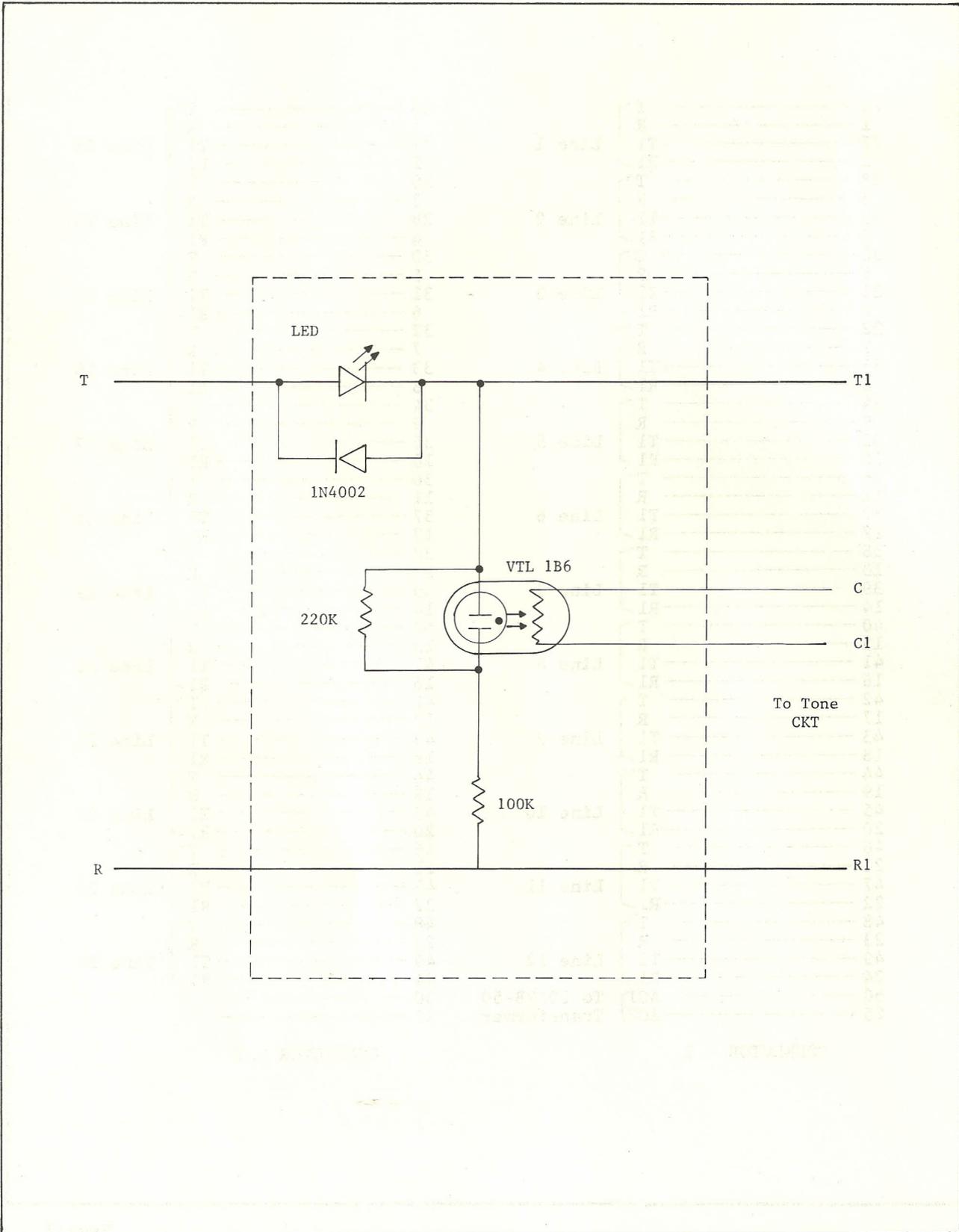


EXHIBIT 6

TONE CIRCUIT

