SD-99356-01

SHEET INDEX

CONTENTS	SHEET NO.	ISSUE NO.																																																		SHEET NO.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
SHEET INDEX SUPPORTING INFORMATION OPTION INDEX	A1				4	5	6	7	8	9	10	11	12	13	14																																					A1
FS 1 RECORDER COUPLER CKT (1)	B1	1	2	3	4	4	4	4	8	8	10	10	12	12	12																																					B1
FS 2 RECORDER COUPLER CKT (2)	B2	1	1	3	4	4	4	7	8	8	10	10	12	12	12																																					B2
FS 3 KS-19522,L11 VOICE CONTROL CKT (T)	B3				4	5	5	5	8	9	9	11	12	13	13																																					B3
FS 4 KS-19522, L12 TEST SET CKT	B4					5	5	5	5	5	5	5	5	5	5																																					B4
FS 5 KS-19522,L21 RECORDER COUPLER	B5													13	13																																					B5
FS 6 MODIFICATION FOR 2-WAY TRANSMISSION	B6													13	13																																					B6
APP FIG. 1 (1)	C1	1	2	3	4	5	5	5	5	5	10	10	10	10	10																																					C1
APP FIG. 2 (2)	C2	1	1	3	4	5	5	7	7	9	10	10	12	12	12																																					C2
APP FIG. 3 (T), APP FIG. 4	C3				4	5	5	5	5	9	9	11	11	11	11																																					C3
APP FIG.5	C4													13	13																																					C4
CIRCUIT NOTES EQUIPMENT NOTES INFORMATION NOTES	D1				4	5	6	7	7	7	10	11	12	13	13																																					D1
SC 1 AUTOMATIC OPERATION SC 2 REMOTE START	E1				4	4	4	4	4	4	4	4	4	4	4																																					E1
CIRCUIT REQUIREMENTS TABLE	F1	1	2	3	4	5	5	5	5	5	5	5	5	5	5																																					F1

SUPPORTING INFORMATION

CATEGORY	NO.

DWG ISS	CD ISSUE	DWG ISS	CD ISSUE	DWG ISS	CD ISSUE
1	1A	2A	1A APP 1A	3B	2B

DWG ISS	CD ISSUE	DATE ISSUED	DRAWN	APPD	
4B	3B	10-20-65	JG HVM	HWE CEP DLV	
5B	4B	4-1-66		EVK CEP RWW	HQ
6D	5D	5-3-66	CRA	EVK CEP RWW	HQ
7D	6D	11-22-67	LC	WWG CEP RWW	HQ
8D	6D APP 1D	3-16-68	CRA	EVK CEP RWW	HQ
9D	7D	4-10-69	JHS CRA	EVK CEP RWW	HQ
10D	7D APP 1D	11-7-69	JK CRA	EVK RSE RWW	HQ
11B	7D APP 2B	9-19-73	ADC JHS	EVK AB RDW	HQ
12D	7D APP 3D	9-19-73	ADC JHS	EVK AB RDW	HQ
13B	8B	9-19-73	ADC JHS	EVK AB RDW	HQ
14D1	8B APP 1D1	2-4-80	ZEN NAE	DPB JFR JTR	HQ1

SHEET INDEX NOTES

1. WHEN CHANGES ARE MADE IN THIS DRAWING, ONLY THOSE SHEETS AFFECTED WILL BE REISSUED.
2. THIS SHEET INDEX WILL BE REISSUED AND BROUGHT UP TO DATE EACH TIME ANY SHEET OF THE DRAWING IS REISSUED, OR A NEW SHEET IS ADDED.
3. THE ISSUE NUMBER ASSIGNED TO A CHANGED OR NEW SHEET WILL BE THE SAME ISSUE NUMBER AS THAT OF THE SHEET INDEX.
4. SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NUMBER.
5. THE LAST ISSUE NUMBER OF THE SHEET INDEX IS RECOGNIZED AS THE LATEST ISSUE NUMBER OF THE DRAWING AS A WHOLE.

OPTION INDEX

APP OR WIRING	LOCATION
Z	1C0,2C0
Y	1C0,2C0
X	1G5,2G5
W	1G5,2G5
V	1H4,2H4
U	1H4,2H4
T	1E0,1F0,1H4 1H5,1B7,2E0, 2F0,2H4,2H5, 1A7, APP FIG.3
S	3D7,1F0,2F0
R	3D7
Q	1H4,2H4
N	APP FIG.2,2B0
M	APP FIG.2
K	APP FIG.1.2
J	APP FIG.1.2
H	APP FIG.5
G	APP FIG.3
F	APP FIG.2
E	SC5
D	SC5

ISSUE 14D1 HQ

SD-99356-01 3K99

STATION SYSTEMS

RECORDER COUPLER CIRCUIT
KS-19522 RECORDER COUPLERS

(2)

MFR DISC

SD-99356-01-A1
14 SHEETS

BELL TELEPHONE LABORATORIES INCORPORATED
DWG SIZE 6S
PRINTED IN U.S.A.

(1)

SD-99356-01-A1

②FS 2
RECORDER COUPLER CKT
(SEE NOTE 303)

PLUG FURNISHED WITH CONN CKT SEE NOTE 201

TO TELEPHONE LINE

TO LOCAL TELEPHONE SET OR KEY TELEPHONE PICKUP

TO KEY TELEPHONE SET OR CONN CKT AS REQD

TO 110V 60~

TO CONN CKT AS REQD

TERM ON CHASSIS

BLUE DOT TERM.

RED DOT TERM.

DRAWING ISSUE	
1	
3B	
5B	
7D	
8D	
10D	
12D	

ISSUE 12D

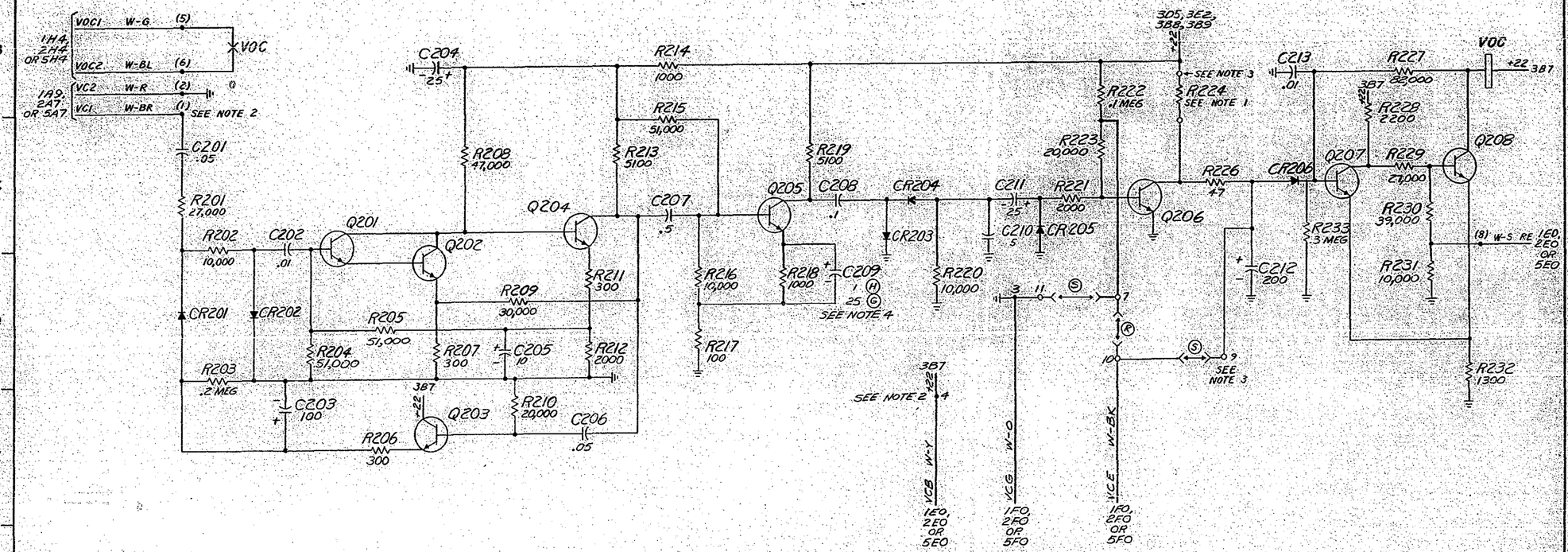
RECORDER COUPLER CIRCUIT ② SD-99356-01-B2

BELL TELEPHONE LABORATORIES INCORPORATED DWG SIZE 6S PRINTED IN U.S.A.

SD-99356-01-B2

⑦FS 3

KS-19522 L11
VOICE CONTROL CKT



SHEET NOTES:

1. VALUE OF (R224) RESISTOR IS SELECTED DURING MANUFACTURE TO PROVIDE A 12 SECOND TIME OUT OF VOICE CONTROL. (TYPICAL VALUE - 56,000 OHMS, 1/2 W.)

2. INDICATES LEADS SOLDERED DIRECTLY TO PRINTED BOARD. LEADS ARE FURNISHED WITH SPADE TIPS ON FREE END.

3. INDICATES SOLDER TYPE TERMINALS ON PRINTED BOARD.

4. PRINTED BOARDS HAVING LETTER ⑥ STAMPED NEAR RESISTOR R220 ARE FURNISHED WITH A 25UF CAPACITOR.

DRAWING ISSUE
4B
5B
8D
9D

ISSUE 13B

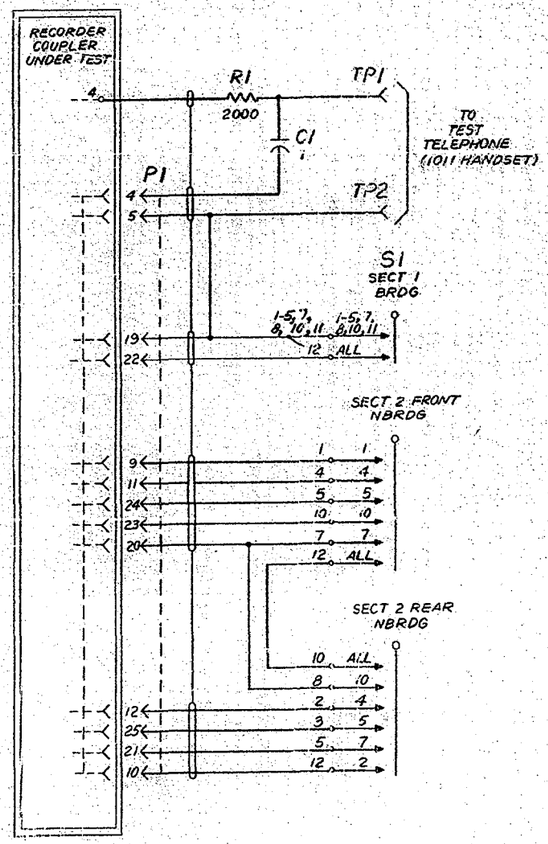
RECORDER COUPLER CIRCUIT ④ SD-99356-01-B3

BELL TELEPHONE LABORATORIES INCORPORATED 6S

SD-99356-01-B3

FS 4

KS-19522, L2
TEST SET CKT



DRAWING ISSUE 5B

5

RECORDER COUPLER CIRCUIT

SD-99356-01-B4

BELL TELEPHONE LABORATORIES INCORPORATED

6S

SD-

FS 5

RECORDER COUPLER CKT
KS-19522, L21

SD-99356-01-B5

ISSUE 13B

RECORDER COUPLER CIRCUIT

SD-99356-01-B5

BELL TELEPHONE LABORATORIES INCORPORATED

6S

②FS6 RECORDER COUPLER CKT

MODIFICATION FOR 2-WAY TRANSMISSION

TO TELEPHONE LINE

TO LOCAL TELEPHONE SET OR KEY TELEPHONE PICKUP

TO KEY TELEPHONE SET OR CONN CKT AS REQD

TO 110V 60~

TO CONN CKT AS REQD

TERM ON CHASSIS

*BLUE DOT TERM.

RED DOT TERM.

PLUG FURNISHED WITH COMM CKT SEE NOTE 201

(SPEECH) (RING UP) (LINE SEIZURE) (MESSAGE RECORD) (START) (TRANSFER) (REMOTE START) (COMMON) (ANNOUNCE) (MESSAGE) (READY) (TONE)

SHEET NOTES FOR MODIFICATION:

DASHED LINES (----) ADDED OR RELOCATED
HASHED LINES (////) INDICATE OPEN CIRCUIT OR REMOVED FROM CIRCUIT
CIRCLED NUMBERS (3000) INDICATE CHANGE IN VALUE OR TYPE OF COMPONENT.

FOR MODIFICATION INFORMATION REGARDING 2-WAY TRANSMISSION SEE BSRS 455-204.

ISSUE 13B

RECORDER COUPLER CIRCUIT — SD-99356-01-B6

BELL TELEPHONE LABORATORIES INCORPORATED — 6S

SD-99356-01-B6

CAPP FIG. 1

SEE NOTE 3

RELAY

CPC
B-651142

	1D6
	1B2

T
PHASE
STYLE 201-15P
19000

	1E4
	1D5

RELAY
ENA
B-570335

	1C7
	1F6
	1F3

RELAY
RU
B-570216

	1F5
	1G1

RELAY
B-570336

	LS	TR
	1A1	1D4
	1D7	1E7
	1E6	1D5
	1D1	1F1
	1B1	1A5
	1E1	1B4
	1D7	1F5

CAPACITOR

	DESIG	LOC	CODE	
	C1	1A1	KS-13814,L9	
*	C2	1C1	KS-13814,L1	
	C3	1B2	5428	
	C4	1B2	5428	
	C5	1B3	KS-13814,L6	
	C6	1C3	KS-13814,L9	
	C7	1D2	.05 UF, 100VDCW ±5% TYPE PJ AMCO ELECTRONICS INC.	
	C8	1B4	402106J012554	SPRAGUE OR EQUIV
	C9	1A5	95P33201	
	C10	1C5	19UF-15292	
	C11	1C6	402256DC250D6	
	C12	1B6	KS-13814,L1	
	C13	1D6	402356DC250D4	SPRAGUE OR EQUIV
	C14	1D5	402256DC350M4	
	C15	1F4	402256DC250D4	
	C16	1G2	410,031310	
	C17	1G2	5402C70D5CF12	
	C18	1F5	402505F025GB4	

CONNECTOR

DESIG	LOC	CODE
J1	1B7	KS-19097,L2

CORD AND PLUG

DESIG	LOC	CODE
P01	1G0	

DIODE

DESIG	LOC	CODE
CR1	1D5	1N1692, GENERAL ELECTRIC C.
CR2	1E6	
CR3	1F5	
CR4	1E5	
CR5	1F6	
CR6	1F7	
CR7	1G0	
CR8	1G6	
CR9	1G1	
CR10	1G2	
CR11	1G1	
CR12	1G2	1N3879, MOTOROLA SEMICONDUCTOR PRODUCTS INC. OR EQUIV.
CR13	1G3	

INDUCTOR

DESIG	LOC	CODE
L1	1G2	63-156,EL-RAD MFG CO.

RESISTOR

	DESIG	LOC	CODE	
	R1	1B1	2000	TYPE EB
	R2	1B3	1600	
	R3	1C3	4300	
	R4	1D3	560	
	R5	1C3	56,000	
	R6	1C2	15,000	
	R7	1C4	360	
	R8	1A2	13,000	
	R9	1B5	750	
	R10	1B5	62	
	R11	1B5	110	
	R12	1A6	0.15 MEG	
	R13	1B6	51,000	ALLEN BRADLEY OR EQUIV ±5%
	R14	1A6	330	
	R15	1A6	15,000	
	R16	1B7	150	
	R17	1C7	150	
	R18	1C7	1600	
	R19	1D6	51	
	R20	1F3	22,000	
	R21	1E4	100	
*	R22	1F4	7500	TYPE EB
	R23	1G3	1000	TYPE EB
	R24	1H2	3.9	TYPE EB
	R25	1G3	5100	
	R26	1G2	51	
	R27	1H7	16,000	
	R28	1G2	330	
*	R29	1G1	20,000	TYPE EB

TRANSFORMER

DESIG	LOC	CODE
T1	1A3	3-570332
T2	1B6	3-570333
T3	1G1	8-570334

TRANSISTOR

DESIG	LOC	CODE
Q1	1C3	2N2924, GENERAL ELECTRIC CO. OR 16G (SEE NOTES 2 & 10?)
Q2	1B5	
Q3	1E3	16G
Q4	1H3	2N2956, TEXAS INSTRUMENTS INC. OR EQUIV.

VARISTOR

DESIG	LOC	CODE
RV2	1C5	190A
RV3	1E6	191A

SHEET NOTES:

1. UNLESS OTHERWISE SPECIFIED "B" NUMBERS REFERRED TO ARE BTL DRAWING NUMBERS; ORDER AS FOLLOWS: "B_(NO.) (PART OF KS-19522)"

2. WHEN (C2) IS 16G TRANSISTOR, RESISTOR (R15) SHALL BE 7500 OHMS ±5%.

3. * OR SOME EARLY PRODUCTION UNITS (C2) IS 53505, (R22) IS 51000, AND (R29) IS NOT PROVIDED.

DRAWING ISSUE

4B	
5B	
10D	

10

RECORDER COUPLER CIRCUIT	SD-99356-01-C1
BELL TELEPHONE LABORATORIES INCORPORATED	6S

SD-99356-01-C1

②APP FIG. 2

SEE NOTE 1

RELAY

RELAY	CODE	LOC
CPC	B-651142	2D6, 2C2
T	B-651143	2E4, 2D5
ENA	B-570335	2C7 (9-8, 10), 2F6 (6-7), 2F3 (4-1)
RU	B-570416	2F4 (2-1, 3), 2C1 (5-4)

RELAY B-570336

CONTACTS	LS	TR
21 - 20, 22	2A1	2E7
18 - 17, 19	2D1	2D4
15 - 14, 16	2E6	2F6
12 - 11, 13	2D1	2F1
9 - 8, 10	2B1	2B5
6 - 5, 7	2E1	2B5
4 - 1	2D7	2F5

CAPACITOR

DESIG	LOC	CODE	
(N) C1	2A1	KS-13814,L9	
(M) C1	2C1	KS-13815,L4 OR EQUIV.	
C2	2C1	KS-13814,L1	
C3,4	2(A,B)2	542S	
C5	2A3	542C	
C6	2C3	KS-13814,L12	
C7	2D2	.05UF, 100V-DC CW ±5% TYPE PJ ARCO ELECTRONICS INC.	
C8	2C6	40D106G012	SPRAGUE OR EQUIV
C9	2A5	192P33292	SPRAGUE OR EQUIV
C10	2C4	40D256G025CC4	SPRAGUE OR EQUIV
C11	2B5	KS-13814,L9	
C12	2D6	40D356G025DD4	SPRAGUE OR EQUIV
C13	2D5	40D756G025DF4	SPRAGUE OR EQUIV
C14	2F3	40D256G025CC4	SPRAGUE OR EQUIV
(K) C15	2G2	41D TYPE 100 MFD + 5CY (D-31310)	SPRAGUE OR EQUIV
(J) C15	2G2	34D207G050FL2	SPRAGUE OR EQUIV
C16	2D3	40D505F025BB4	SPRAGUE OR EQUIV
C17	2G3	40D756G025DF4	SPRAGUE OR EQUIV
(N) C18	2C1	KS-13815,L4 OR EQUIV.	
(F) C19	2C6	KS-19658,L13 OR EQUIV. SEE NOTE 2	

CONNECTOR

DESIG	LOC	CODE
J1	2A7	KS-19087,L2

CORD AND PLUG

DESIG	LOC	CODE
PG1	2G0	

DIODE

DESIG	LOC	CODE
CR1	2D5	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR2	2E6	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR3	2F5	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR4	2E6	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR5	2F6	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR6	2F7	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR7	2G5	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR8	2G6	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR9	2G1	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR10	2G2	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR11	2G1	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR12	2G2	1N5059 GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR13	2G3	426M WECO OR 1N3026B, MOTOROLA OR APPROVED EQUIVALENT

INDUCTOR

DESIG	LOC	CODE
L1	2D2	63-156,EL-RAD MFG CO.

RESISTOR

DESIG	LOC	CODE		
(M) R1	2B1	1000	TYPE CB	ALLEN BRADLEY OR EQUIV ±5%
(N) R1	2B1	2000		
R2	2B2	1300		
R3	2C3	3000		
R4	2D3	430		
R5	2C2	56,000		
R6	2C2	15,000		
R7	2B4	560		
R8	2B4	13,000		
R9	2C5	750		
R10	2C5	220		
R11	2A5	24,000		
R12	2A4	30,000		
R13	2C5	7500		
R14	2C5	820		
R15	2B6	10,000		
R16	2B7	300		
R17	2B7	300		
R18	2A7	750		
R19	2D6	51		
R20	2F4	22,000		
R21	2E4	100		
R22	2F4	13,000	TYPE CB	
R23	2G3	820	TYPE GB	
R24	2H2	6.8	KS-14603,L3A	
R25	2G3	5100	TYPE CB	ALLEN BRADLEY OR EQUIV ±5%
R26	2D2	51		
R27	2H7	16,000		
R28	2B3	330		
R29	2C1	20,000		
(M) R30	2C1	1000	TYPE CB	
(F) R31	2C7	100	TYPE EB SEE NOTE 2	

TRANSFORMER

DESIG	LOC	CODE
T1	2A3	B-570332
T2	2A6	B-570333
T3	2G1	B-570334

TRANSISTOR

DESIG	LOC	CODE
Q1	2C3	12D
Q2	2B5	12G
Q3	2E3	12G
Q4	2H3	2N250A, TEXAS INSTRUMENTS INC. OR EQUIV

VARISTOR

DESIG	LOC	CODE
RV1	2A6	100A
RV2	2E6	317A

SHEET NOTES:

1. UNLESS OTHERWISE SPECIFIED "B" NUMBERS REFERED TO ARE BTL DRAWING NUMBERS; ORDER AS FOLLOWS: "B_(NO.)_ (PART OF KS-19522)"
2. COUPLERS MODIFIED PER BSRS 455.204 FOR THE F OPTION ARE IDENTIFIED BY STAMPING "MX2" ON PRINTED BOARD LOWER RIGHT HAND CORNER NEAR J1 CONNECTOR.

DRAWING ISSUE: 1, 3B, 4B, 5B, 7D, 9D, 10D

ISSUE 12D

RECORDER COUPLER CIRCUIT ② SD-99356-01-C2

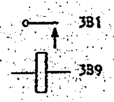
BELL TELEPHONE LABORATORIES INCORPORATED — DWG SIZE 6S — PRINTED IN U.S.A.

SD-99356-01-C2

Ⓣ APP FIG. 3

RELAY

VOC
B-651143



CAPACITOR

DESIG	LOC	CODE	
C201	3C0	KS-13814,L1	
C202	3C1	KS-13814,L2	
C203	3D1	400107G003DC4	SPRAGUE OR EQUIV
C204	3B2	400256G025DD4	SPRAGUE OR EQUIV
C205	3D3	400106G012BB4	SPRAGUE OR EQUIV
C206	3E3	KS-13814,L1	
C207	3C4	KS-13814,L12	
C208	3C5	KS-13814,L9	
Ⓗ C209	3D5	400105G012BB4	SPRAGUE OR EQUIV
C210	3C6	400505G012BB4	SPRAGUE OR EQUIV
C211	3C6	400256G012CB4	SPRAGUE OR EQUIV
C212	3D7	400207F012DH4	SPRAGUE OR EQUIV
C213	3B8	KS-13814,L2	
Ⓖ C209	3D5	400256G012CB4	SPRAGUE OR APPROVED EQUIVALENT SEE NOTE 2

DIODE

DESIG	LOC	CODE
CR201	3D0	MOTOROLA, 1N4001 OR ERIE, ED30008 OR APPROVED EQUIVALENT
CR202	3D1	MOTOROLA, 1N4001 OR ERIE, ED30008 OR APPROVED EQUIVALENT
CR203	3C5	1N90 HUGHES
CR204	3C5	1N90 HUGHES
CR205	3D6	1N90 HUGHES
CR206	3C8	MOTOROLA, 1N4001 OR ERIE, ED30008 OR APPROVED EQUIVALENT

RESISTOR

DESIG	LOC	CODE	
R201	3C0	27,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R202	3C1	10,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R203	3D1	.2 MEG	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R204	3D1	51,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R205	3D2	51,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R206	3E2	300	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R207	3D2	300	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R208	3C2	47,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R209	3D3	30,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R210	3E3	20,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R211	3D3	300	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R212	3D3	2000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R213	3C3	5100	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R214	3B4	1000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R215	3C4	51,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R216	3D4	10,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R217	3D4	100	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R218	3D4	1000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R219	3C5	5100	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R220	3D5	10,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R221	3C6	2000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R222	3B6	82,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R223	3C6	20,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R224	3B7	SEE NOTE 1	1/2 WATT ±5% ALLEN BRADLEY TYPE EB OR EQUIV
R226	3C7	47	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R227	3B8	82,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R228	3C8	2200	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R229	3C8	27,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R230	3C8	39,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R231	3D8	10,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R232	3D9	1300	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV
R233	3C8	300,000	1/4 WATT ±5% ALLEN BRADLEY TYPE CB OR EQUIV

TRANSISTOR

DESIG	LOC	CODE
Q201	3C2	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q202	3D2	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q203	3E2	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q204	3C3	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q205	3C4	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q206	3C7	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q207	3C8	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT
Q208	3C9	GE CO, 2N2924 OR TEXAS INST, TI415 OR FAIRCHILD, SE4001 SEE NOTE 110 OR APPROVED EQUIVALENT

APP FIG. 4

CAPACITOR

DESIG	LOC	CODE
C1	4B2	542D

JACK

DESIG	LOC	CODE
TP1	4B2	H.H. SMITH, 1503-113 JACK
TP2	4B2	H.H. SMITH, 1503-113 JACK

RESISTOR

DESIG	LOC	CODE
R1	4B2	2000, 1/2W ±5% TYPE EB, ALLEN BRADLEY OR EQUIV

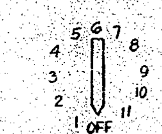
CONNECTOR

DESIG	P1
CODE	KS-19088,L2
OPTION	
TERM.	LOC
25	4E1
24	4D1
23	4D1
22	4C1
21	4E1
20	4D1
19	4C1
18	
17	
16	
15	
14	
13	
12	4E1
11	4D1
10	4F1
9	4D1
8	
7	
6	
5	4B1
4	4B1
3	
2	
1	

SWITCH

DESIG		S1
CODE		B-577715
SECT		LOC
1	FRONT	4C2
2	FRONT	4D2
2	REAR	4E2

SWITCH TOP



SHEET NOTES:

1. VALUES OF (R224) RESISTOR IS SELECTED DURING MANUFACTURE TO PROVIDE A12 SECOND TIME OUT OF VOICE CONTROL. (TYPICAL VALUE - 56,000 OHMS.)
2. PRINTED BOARDS HAVING LETTER Ⓑ STAMPED NEAR RESISTOR R220 ARE FURNISHED WITH A 25UF CAPACITOR.

ISSUE 11B

RECORDER COUPLER CIRCUIT ②

BELL TELEPHONE LABORATORIES INCORPORATED | 6S

SD-99356-01-C3

PRINTED IN U.S.A.

SD-99356-01-C3

APP FIG. 5

SEE NOTE 1

RELAY

CPC B-651142

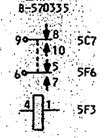
5D6
5C2

T B-651143

5E4
5D5

RELAY

ENA B-570335



RELAY

RU B-570416

RELAY

B-570336

LS	TR
5A1	5E7
5D1	5D4
5E6	5F6
5D1	5F1
5B1	5B5
5E1	5B5
5D7	5F5

CAPACITOR

DESIG	LOC	CODE
C1	5C1	KS-13815,L4 OR EQUIV.
C2	5C1	KS-13814,L1
C3,4	5(A,B)2	542S
C5	5A3	542C
C6	5C3	KS-13814,L12
C7	5D2	.05UF, 100V DC CW ±5% TYPE PJ ARCO ELECTRONICS INC.
C8	5C6	40D106G012BB4 (SPRAGUE OR EQUIV)
C9	5A5	192P33292 (SPRAGUE OR EQUIV)
C10	5C4	40D256G025CC4
C11	5B5	KS-13814,L9
C13	5D5	40D756G025DF4 (SPRAGUE OR EQUIV)
C14	5F3	40D256G025CC4 (SPRAGUE OR EQUIV)
C15	5G2	34D20G050FL2 (SPRAGUE OR EQUIV)
C16	5D3	40D505F025BB4 (SPRAGUE OR EQUIV)
C17	5G3	40D756G025DF4 (SPRAGUE OR EQUIV)
C18	5C1	KS-13815,L4 OR EQUIV.
C20	5C5	596C,2.15UF
C21	5D5	KS-19774,L5, .022UF
C22	5E4	KS-19774,L5, .10UF

CONNECTOR

DESIG	LOC	CODE
J1	5A7	KS-19087,L2

CORD AND PLUG

DESIG	LOC	CODE
PG1	5G0	

DIODE

DESIG	LOC	CODE
CR1	5D5	1N5059, GENERAL ELECTRIC CO. OR APPROVED EQUIVALENT
CR2	5E6	
CR3	5F5	
CR4	5E6	
CR5	5F6	
CR6	5F7	
CR7	5G5	
CR8	5G6	
CR9	5G1	
CR10	5G2	
CR11	5G1	
CR12	5G2	
CR13	5G3	426M,WECO OR 1N3026B, MOTOROLA OR EQUIVALENT
CR14	5D5	
CR15	5D5	1N5059 GE OR EQUIV.
CR16	5D5	459J

INDUCTOR

DESIG	LOC	CODE
L1	5D2	63-156,EL-RAD MFG CO.

RESISTOR

	DESIG	LOC	CODE	
	R1	5B1	1000	TYPE CB (ALLEN BRADLEY OR EQUIV. ±5%)
	R2	5B2	1300	
	R3	5C3	3000	
	R4	5D3	430	
	R5	5C2	56,000	
	R6	5C2	15,000	
	R7	5B4	560	
	R8	5B4	13,000	
	R9	5C5	750	
	R10	5C5	220	
	R11	5A5	24,000	
	R12	5A4	30,000	
	R13	5C5	8200	
	R14	5C5	820	
	R15	5B6	10,000	
	R16	5B7	300	
	R17	5B7	300	
	R18	5A7	750	
	R19	5D4	51	
	R20	5F4	22,000	
	R21	5E4	100	
	R22	5F4	13,000	TYPE CB
	R23	5G3	820	TYPE GB
	R24	5H2	6.8	KS-14603,L3A
	R25	5G3	5100	TYPE CB (ALLEN BRADLEY OR EQUIV ±5%)
	R26	5D2	51	
	R27	5H7	16,000	
	R28	5B3	330	
	R29	5C1	20,000	
M	R30	5C1	1000	
	R32	5D6	20,000	
	R33	5D6	100,000	
	R34	5D5	120	
	R35	5E5	1 MEG	TYPE CB (ALLEN BRADLEY OR EQUIV ±5%)
	R36	5D7	120	KS-20810
	R37	5D4	61,900	KS-20810
	R38	5D5	215,000	KS-20810
	R39	5D4	150,000	TYPE CB (ALLEN BRADLEY OR EQUIV. ±5%)

TRANSFORMER

DESIG	LOC	CODE
T1	5A3	B-570332
T2	5A6	B-570333
T3	5G1	B-570334

TRANSISTOR

DESIG	LOC	CODE
Q1	5C3	51G
Q2	5B5	51D
Q3	5E3	51D
Q4	5H3	2N250A, TEXAS INSTRUMENTS INC. OR EQUIV.
Q5	5E6	66G
Q6	5D6	66G

VARISTOR

DESIG	LOC	CODE
RV1	5A6	100A
RV2	5E6	317A
RV3	5G6	317A

SHEET NOTES:
1. UNLESS OTHERWISE SPECIFIED "B" NUMBERS REFFERED TO ARE BTL DRAWING NUMBERS; ORDER AS FOLLOWS: "B (NO.) (PART OF KS-19522)"

ISSUE 13B

RECORDER COUPLER CIRCUIT — SD-99356-01-C4

BELL TELEPHONE LABORATORIES INCORPORATED — 6S

SD-99356-01-C4

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
BATTERY SYMBOL		VOLTAGE RANGE	

102.

FEATURE OR OPTION		PROVIDE APP FIG.	PROVIDE APP OR WRG	PROVIDE QUANTITY
KS-19522,L1 RECORDER COUPLER		1 OR 2		1 PER CKT SEE NOTES 303 & 305
KS-19522,L2 RECORDER COUPLER		2 AND 3		1 PER CKT SEE NOTES 105 & 303
RINGING	BRIDGED		Z	
	2-PARTY SERVICE		Y	
ANNOUNCEMENT RECORDER (WITH LIST 1 & 21 RECORDER COUPLERS)	PROVIDED BY CUSTOMER		U,X	SEE NOTE 105
	PROVIDED BY KS-16765 LIST 1 ANNOUNCEMENT SET		W,V	SEE NOTES 106 & 302
ANNOUNCEMENT RECORDER (WITH LIST 2 & 22 RECORDER COUPLERS)	PROVIDED BY CUSTOMER		T,X	SEE NOTE 112
	PROVIDED BY KS-16765 LIST 1 ANNOUNCEMENT SET		Q,W	SEE NOTES 113 & 302
KS-19522,L11 VOICE CONTROL		3	T	1 PER CKT SEE NOTES 108 & 307
VOICE ENABLE CONTROL	REMOVAL OF GROUND CLOSURE		S	SEE NOTES 111 & 114
	CLOSURE TO GROUND		R	SEE NOTE 109
KS-19522,L12 TEST SET		4		SEE NOTE 306
KS-19522,L21 RECORDER COUPLER		5		1 PER CKT SEE NOTES 116 & 105
KS-19522,L22 RECORDER COUPLER		3 & 5		1 PER CKT SEE NOTES 105,116, 112,308

103.

RECORD OF APP FIGURES, WIRING AND APPARATUS CHANGES								
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT STD	A&M	MD		
5B			102	APP FIG. 4				
7D	M OR N	N		M		N		
10D	K OR J	K		J		K		
11B	H OR G	H		G		H		

CIRCUIT NOTES: (CONT)

105. WIRING FOR OPTIONS U AND X FURNISHED WITH LIST 1 AND LIST 21 COUPLERS AT TIME OF MANUFACTURE.

106. REMOVE WIRING FOR OPTIONS U AND X.

107. 16G TRANSISTORS MAY BE USED FOR (Q1) AND (Q2). WHEN (Q2) IS A 16G, RESISTOR (R15) SHALL BE 7500 OHMS ±5%. (SEE NOTE 304.)

108. REMOVE WIRING FOR OPTION U.

109. WIRING FOR OPTION R FURNISHED WITH VOICE CONTROL AT TIME OF MANUFACTURE.

110. 16G TRANSISTORS MAY BE USED FOR Q201 TO Q208 INCLUSIVE (SEE NOTE 304).

111. REMOVE WIRING FOR OPTION R.

112. WIRING FOR OPTIONS T & X FURNISHED WITH LIST 2 AND LIST 22 COUPLERS AT TIME OF MANUFACTURE.

113. REMOVE WIRING FOR OPTION X.

114. WHEN S OPTION IS PROVIDED IN VOICE CONTROL (OPTION T) THE VCE LEAD SHALL BE CONNECTED TO TERMINAL 11 OF THE RECORDER COUPLER.

115. WHEN F OPTION IS PROVIDED IT CONNECTS A SLOW-RELEASE CIRCUIT ACROSS THE LINE-SEIZURE (LS) RELAY TO MAINTAIN THE LS RELAY OPERATED FOR APPROXIMATELY 150-MILLISECONDS INSTEAD OF THE NORMAL 8 MILLISECOND DELAY. (REFER TO BSRS 455.204 FOR INFORMATION).

116. WHEN E OPTION IS PROVIDED IN COUPLER, STRAPS SHALL BE CONNECTED BETWEEN TERMINALS S,C AND C,L. THIS PROVIDES A DELAY OF CPC DISCONNECT BETWEEN 80 TO 125 MS.

WHEN D OPTION IS PROVIDED, A STRAP SHALL BE CONNECTED BETWEEN TERMINALS C AND L. THIS PROVIDES A DELAY OF CPC DISCONNECT BETWEEN 350 TO 570 MS.

EQUIPMENT NOTES:

201. PLUG, PART OF CABLE FROM CONNECTING CIRCUIT IS: KS-19088,L2 CONNECTOR E/W KS-19196,L2 HOOD OR DB-19604-432 PLUG (CINCH MFG CORP OR CANNON ELECTRIC CO) E/W DB-51226-1 HOOD (CINCH MFG CORP) OR EQUIV.

INFORMATION NOTES:

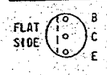
301. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, VALUES PRECEDED BY THE SYMBOL +(PLUS) OR -(MINUS) ARE IN VOLTS.

302. REFER TO PLANT SERIES BELL SYSTEM PRACTICE 463-234-100 - "KS-19522, LIST 1, 1A AND 2 RECORDER COUPLERS USED WITH KS-16765, LIST 1 ANNOUNCEMENT SET, IDENTIFICATION, INSTALLATION CONNECTIONS, AND MAINTENANCE."

303. KS-19522,L1 RECORDER COUPLERS MANUFACTURED AFTER NOVEMBER 1964, & KS-19522,L2 RECORDER COUPLER ARE IN ACCORDANCE WITH APP FIG. 2. COUPLERS PER APP FIG. 2 (DATE STAMPED DECEMBER, 1964, OR LATER) ARE ALSO MARKED WITH (A) NEAR THE CODE MARKING ON THE PRINTED WIRING BOARD NEAR TERMINAL STRIP.

304. TRANSISTOR LEAD ARRANGEMENT:

GE 2N2924 OR TI415



(BOTTOM VIEW)

16G OR FAIRCHILD SC4001

(BOTTOM VIEW)

(REFER TO LABEL INSIDE COVER FOR TRANSISTOR ORIENTATION.)

305. WHEN LIST 1 RECORDER COUPLERS ARE CONVERTED TO LIST 2 UNITS (BY ADDING T OPTION), FEATURE OR OPTION FOR LIST 2 RECORDER COUPLER WILL APPLY.

306. REFER TO PLANT SERIES BELL SYSTEM PRACTICE RECORDER COUPLER, KS-19522; MAINTENANCE, FOR INFORMATION AND TEST PROCEDURE.

307. KS-19522,L11 VOICE CONTROL CIRCUITS MANUFACTURED AFTER JANUARY 1973 ARE MARKED WITH (B) IN THE SPACE ADJACENT TO R220 ON THE PRINTED WIRING BOARD.

308. WHEN LIST 21 RECORDER COUPLERS ARE CONVERTED TO LIST 22 UNITS (BY ADDING T OPTION) FEATURE OR OPTION FOR LIST 22 RECORDER COUPLER WILL APPLY.

DRAWING ISSUE: 4B, 5B, 6B, 7D, 10D

ISSUE 13B

RECORDER COUPLER CIRCUIT (2) SD-99356-01-D1

BELL TELEPHONE LABORATORIES INCORPORATED SIZE 6S

SD-99356-01-D1

SD-99356-01

CIRCUIT REQUIREMENTS

RECORDER COUPLER CIRCUIT

APPARATUS					MECH REQT			CIRCUIT PREPARATION			TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT					REMARKS
DESIG	CODE	OPT.	FIG.		BSP FIG.	CONT PRES	ARM. TRVL	BLOCK OR INSULATE	TEST CLIP DATA CONN BAT.	TEST CLIP DATA CONN GRD			TEST WDG	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	
RELAYS																		
CPC	B-651142		1						TERM. T	TERM. R	NGB	3,5,7		0		20		
CPC	B-651142		2						TERM. T	TERM. R	NGB	3,5,7		0		20		
ENA	B-570335		1						1(ENA)	4(ENA)	NGB	1,2		NO		11V		
														0		21		
LS	B-570336		1						1(LS)	4(LS)	NGB	1,2		0		18V		
RU	B-570416		1						5(RU)	4(RU)	NGB	1,5,6		NO		0.50	0.52	
														0		0.60	0.57	
T	SEE REMARKS		1						C13 (NEG END)	TERM. 6	NGB	1,4, 5,7		0		14V		PRICE, STYLE 201-15P
T	B-651143		2						C13 (NEG END)	TERM. 6	NGB	1,4, 5,7		0		5V		
TR	B-570336		1						1(TR)	4(TR)	NGB	1,2		0		18V		
VOC	B-651143		3						W-Y LEAD	R227 PIGTAIL LOWER END	NGB	8,9		0		5V		

DRAWING ISSUE: 1, 2A, 3B, 4, 5B

TEST NOTES:

1. REMOVE RECORDER COUPLER FROM SERVICE AND DISCONNECT AC POWER BEFORE PERFORMING TEST. STRAPS SHALL BE IN PLACE BETWEEN TERM. 5 & 6, AND BETWEEN TERM. 7 & 9.

2. REMOVE RELAY FROM SOCKET FOR TEST.

3. APPLY 115V 60CPS AC POWER TO RECORDER COUPLER (ALL RELAYS INSTALLED IN SOCKETS). STRAP TERM. 6 & 7. MOMENTARILY CONNECT TERM. 1 & 6 TO OPERATE RELAYS (LS) & (ENA). APPLY APPLY 20MA DC TO TERM. T & R TO OPERATE RELAY (CPC). REMOVE CONNECTION BETWEEN TERM. 1 & 6. (ENA) WILL RELEASE IN APPROX. 1 SEC. RELAY (LS) SHALL HOLD THROUGH CLOSED CONTACT ON RELAY (CPC). REMOVAL OF BATTERY FROM T & R SHALL CAUSE RELAYS (CPC) & (LS) TO RELEASE. REMOVE STRAP BETWEEN TERM. 6 & 7.

4. OPERATION OF RELAY (T) WILL BE INDICATED BY CONTINUITY BETWEEN TERM. 13 & 6 AS MEASURED BY A CONTINUITY TESTER SUCH AS AN OHMMETER.

5. SEE LABEL INSIDE COVER FOR LOCATION OF COMPONENTS AND TERM.

6. REMOVE RELAYS (LS) & (TR) FROM SOCKET TO PERMIT ACCESS TO WINDING TERMINALS OF RELAY (RU).

7. TERMINALS T, R, 1, 6 & 7 ARE SCREW TERMINALS.

8. DISCONNECT ALL LEADS FROM L11 VOICE CONTROL TO RECORDER COUPLER.

9. OPERATION OF RELAY (VOC) WILL BE INDICATED BY CONTINUITY BETWEEN W-BL AND W-G LEADS.

RECORDER COUPLER CIRCUIT

SD-99356-01-F1

BELL TELEPHONE LABORATORIES INCORPORATED

PRINTED IN U.S.A.

SD-99356-01-F1

DRAWING ISSUE: 1, 2A, 3B, 4B, 5B

5

RECORDER COUPLER CIRCUIT (2)

SD-99356-01-F1

BELL TELEPHONE LABORATORIES INCORPORATED

6S

PRINTED IN U.S.A.