SD-99723-01

SHEET INDEX

SHEET NO.	CONTENTS
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CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
	1-1/3	-48V TALK	CKT

102.

FEATURE OR OPTION			PROVIDE APP FIG.	PROVIDE APP WRG	PROVIDE QUANTITY	REMOVE APP OR WRG
KS-19219,L1 AMPLIFIER			1,2 3,4		1 EACH PER CKT	
		REC-REP OR ANN SYSTEM				
BIAS OSC	DISABLE	3A, 6A, 8A, 9A		Z*		
		5A		Y		Z
	LOW LEVEL	KS-12055				X
	HIGH LEVEL	KS-12068 KS-16534		X*		
LOW FREQ EQUALIZATION		KS-12055 KS-12068		S*		
		KS-16534				S
HIGH FREQ EQUALIZATION		KS-12055 KS-12068,L5				V
		KS-12068,L6 KS-16534		V*		
AUDIO RECORDING HEAD CURRENT	LOW	KS-16534				N
	HIGH	KS-12055 KS-12068		N*		
BATTERY GROUND	POS GRD	3A, 5A, 6A, 8A, 9A		T*		U
	NEG GRD			U		T
OUTPUT TRANSFORMER	1 OHM	KS-16534		N*		Q
	4 OHM			Q		R
REMOTE SWITCHING OF AMPLIFIER POWER FOR CHECKING VOICE OPERATED RELAY CIRCUIT		ENABLED (ESS)	1			M
		DISABLED	1	N		

* INDICATES OPTION FURNISHED WITH AMPLIFIER AS SUPPLIED BY THE MANUFACTURER.

103.

RECORD OF FIGURES, WIRING & APPARATUS CHANGES							
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT STD	A&M	MD	

EQUIPMENT NOTES:

201. THE SHIELDED LEADS TO (TB1) SHALL BE TWISTED PAIRS WITH THE SHIELDS TERMINATED AS SHOWN AT THE AMPLIFIER END ONLY. THE SHIELDS SHALL BE INSULATED THROUGHOUT THEIR LENGTH. THE TOTAL CAPACITANCE BETWEEN THE HIGH-SIDE CONDUCTOR AND THE OTHER CONDUCTOR AND SHIELD FOR THE SHIELDED PAIRS TO THE MAGNETIC HEADS (LEADS RC1, RC2, EC1, & EC2) SHALL NOT EXCEED 500 UUF. THE TYPE OF WIRE SHALL BE AS SPECIFIED ON THE CONNECTING CIRCUIT.

202. WHEN REQUIRED, SHIELDED CABLE FOR THE OUTPUT LEADS SHALL BE SPECIFIED ON THE CONNECTING CIRCUIT.

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. THE VOLTAGES SHOWN ARE TYPICAL DC VALUES WITH AVERAGE TRANSISTORS AND NOMINAL SUPPLY VOLTAGE. RELAY (K1) IS OPERATED TO HAVE THE AMPLIFIER IN THE RECORD CONDITION. VOLTAGES SHOWN THUS ( ) ARE WITH INPUT SIGNAL AND RELAY (K101) OPERATED. THE VOLTAGES ARE MEASURED FROM POINTS SHOWN TO GROUND TERMINAL 24 USING A VOLTMETER HAVING A RESISTANCE OF 10 MEGOHMS MINIMUM.

WORKING LIMITS
MAX COND LOOP RES OF OS1 AND OS2 LEADS—250Ω

SUPPORTING INFORMATION

CATEGORY	NO.

APP OR WRG	LOCATION
Z	2C8
Y	2C8
X	2D3
W	2B2
V	2B?
U	2B8
T	2B8
S	2B5
R	2B8
Q	2B8
N	2B5
M	2B8
L	4FG
K	2FG

DWG ISSUE	EE OR CD ISSUE	DATE ISSUED	DESIGN	APPD
1	1	12-3-62	AM K ASM	WHG WJB DLV
2D	1 APP 2D	3-27-64	ZUM CJH HAE	WHG FFR DLV
3A	1 APP 2A	6-2-64	WEH	WHG FFR DLV
4D	1 APP 3D	2-10-65	WEH	WHG FFR DLV
5D	1 APP 4D	6-8-65	JG	CW FFR DLV
6D	1 APP 5D	6-1-66	CRA	EVK CEP RK J
7B	1 APP 6B	12-6-74	CAY HAE	EVK AB R.WH
8D	1 APP 7D	1-26-79	BAT	WF AB VTK

ISSUE 8D

SD-99723-01 2N06

COMMON SYSTEMS
KS-19219,L1 AMPLIFIER CIRCUIT

A&M ONLY

SD-99723-01-1
5 SHEETS

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SIZE 6S

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SD-99723-01-1

FS 1
AMPLIFIER CIRCUIT

KS-19220, L2 AMPLIFIER CIRCUIT — P1 J C A E K L R M P S

KS-19221, L1 AMPLIFIER CIRCUIT — P1 B C A N R S

J1 J2

RT1

C4 4700 — C5 2200 — TB2 — K1

R2 9100

C6 40 — C7 40 — C8 40 — C2 .001 — C3 .051 — TB3 — R3 5100 — R7 20

T1 TRNSF — TB1 — C1 3000 UUF — R1 10,000 (RECORD) CW — 10T — K1

TB4 — R5 27,000

R4 27,000

T2 TRNSF

SEE NOTE 201 — RC1 — RC2 — EC1 — EC2 — RR

TO CONN CKT AS REQD

11T — 1500 — 88 — CR1

J3

TB4

8T K1

SEE NOTE 202 — T2 OR CT — R OR R2

G3 TO CONN CKT WHEN SPEC OR TO RR GRD

G (+) — G (-) — TO 48V BAT. OR CONN CKT

G2

OS2 — OS1

A

TO CONN CKT

FS 2
OSC. & VOICE OPERATED RELAY CKT

KS-19219, L2

P101

C101 .051 — R102 30,000 — C105 1 — R107 100

R101 39K — C102 .01 — R103 1000 — R104 15,000 — R105 100 — C103 5100 UUF — R106 150 — Q101

L101 — C104 1000UUF

R108 33,000 — R110 1200

R109 50,000 (OPERATE) CW — Q102 — R111 1000

C107 200pUUF — CR102 — C106 40

R112 .1 MEG — R113 .25 MEG (RELEASE) CW — R117 .1 MEG — R114 51,000 — Q103 — Q104 — R115 2000 — R116 820 — Q105

K101 915

P101 J3 TB1 — K101 — TO CONN CKT AS REQD

KS-19219, L1 AMPLIFIER CIRCUIT (2) SD-99723-01-2

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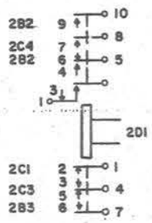
SD-99723-10-2

8B

APP FIG. I
(FS1)

RELAY

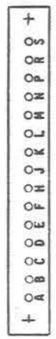
U1460
(ADJUSTED WITH U5 COVER)



CAPACITOR

DESIG	LOC	CODE
C1	2B1	3000 UUF, KS-19066,L3
C2	2B5	.001 UF
C3	2B5	.051 UF
C4	2A2	4700 UUF, KS-13367,L8
C5	2A2	2200 UUF, KS-13367,L8
C6	2B4	40 UF, KS-16390,L8
C7	2A4	40 UF, KS-16390,L8
C8	2A5	40 UF, KS-16390,L8

CONNECTOR



DESIG		J1	J2	J3
CONN		SOCKET		
OPTION				
	NO.	LOC	LOC	LOC
	S	2A4	2A6	2D6
	R	2A3	2A6	2D3
	P	2A4		2D3
	N	-	2A5	2F8
	M	2A4	-	2E8
	L	2A3	-	2E8
	K	2A3	-	2D5
	J	2A3	-	2D4
	H	-	-	-
	F	-	-	-
	E	2A3	-	2D2
	D	-	-	2D5
	C	2A3	2A5	2D4
	B	-	2A5	2D2
	A	2A3	2A5	2D4

DIODE

DESIG	LOC	CODE
CR1	2D1	446A

POTENTIOMETER

DESIG	LOC	CODE
R1	2B2	10,000Ω TYPE 65, "A" TAPER 1/4 INCH BUSHING AND A SCREWDRIVER SLOTTED SHAFT 3/8 INCH F.M.S. A FLAT AT END OF SHAFT 1/32 X 1/32 SHALL BE ON SIDE ADJACENT TO AND INDICATING WIPER CONTACT POSITION. IT SHALL BE LOCATED AT 90° TO SLOT IN SHAFT. CHICAGO TELEPHONE SUPPLY CO. OR APPROVED EQUIVALENT

RESISTOR

DESIG	LOC	CODE
R2	2B4	9100Ω } KS-19150,L1
R3	2B5	5100Ω }
R4	2C4	27,000Ω, KS-19150,L1
R5	2C5	27,000Ω, KS-19150,L1
R7	2B5	20Ω, KS-14603, L1A

TERMINAL BOARD

DESIG	TB1					
CODE	D3A					
	NO.	LOC	NO.	LOC	NO.	LOC
	11	2B1	21	2E8	31	2C1
	12	2B1	22	2E8	32	2C1
	13	2C8	23	2F8	33	2C1
	14	2C8	24	2A8	34	2C1
	15	2B8	25	2A8	35	2C8
	16	2B8	26	2A8	36	2C8
	17	2B8	27	2C8	37	2D1
	18	2B8	28	2C8	38	2D1

DESIG	LOC	CODE
TB2	2A2	CINCH MFG CORP CHICAGO, ILLINOIS NO. 1532
TB3	2B5	B-551643
TB4	2B5	CINCH MFG CORP CHICAGO, ILLINOIS NO. 1542

THERMISTOR

DESIG	LOC	CODE
RT1	2A4	1D

TRANSFORMER

DESIG	LOC	CODE
T1	2B1	2536D
T2	2B6	260BA

DRAWING ISSUE
1 MA MM DLL
2D SAT MRE DLL
3A WEF DL
4D WEF DAV
5D JB CJV CRA
6D ALMS CAY
7B RMM

8B

KS-19219,L1 AMPLIFIER CIRCUIT (2) SD-99723-01-3

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APP FIG. 2

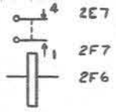
(FS2)

KS-19219,L2 OSC & VOICE OPERATED RELAY
(PRINTED WIRING BOARD ASSEMBLY)

RELAY

MA8

K101



CAPACITOR

DESIG	LOC	CODE
C101	2E2	.051 UF, KS-19066,L3
C102	2F2	.01 UF
C103	2F3	5100 UUF — KS-19066,L3
C104	2G2	1000 UUF
C105	2E4	1 UF-200V, 542D
C106	2F4	40 UF-20V, 602A
C107	2F4	2000 UUF, KS-19066,L3

CONNECTOR

KS-16345,L1

DESIG	P101
CONN	PLUG
OPTION	

NO.	LOC
S	2D6
R	2D3
P	2D3
N	2F7
M	2E7
L	2E7
K	2D5
J	2D4
H	-
F	-
E	2D2
D	2D5
C	2D4
B	2D2
A	2D4

DIODE

DESIG	LOC	CODE
CR102	2F5	446A

INDUCTOR

DESIG	LOC	CODE
L101	2G2	1640C

POTENTIOMETER

DESIG	LOC	CODE
R109	2E4	50,000Ω, "A" TAPER
R113	2G5	.25 MEG, STANDARD "D" TAPER

TYPE 65, 1/4 INCH BUSHING AND A SCREWDRIVER SLOTTED SHAFT 3/8 INCH F.M.S. CHICAGO TELEPHONE SUPPLY CO. OR APPROVED EQUIV.

RESISTOR

DESIG	LOC	CODE
R101	2F2	39,000Ω
R102	2E3	30,000Ω
R103	2F3	1000Ω
R104	2F3	15,000Ω
R105	2F3	100Ω, KS-19151,L1
R106	2F3	150Ω, KS-19150,L1
R107	2E4	100Ω, KS-19151,L1
R108	2E5	39,000Ω, KS-19150,L1
R110	2E6	1200Ω, KS-19152,L1
R111	2E5	1000Ω
R112	2F5	.1 MEG
R114	2F5	51,000Ω
R115	2F6	2000Ω
R116	2G6	820Ω, KS-19151,L1
(K) R117	2G6	.1MEG, KS-19150,L1

KS-19150,L1

TRANSISTOR

DESIG	LOC	CODE
Q101	2E3	20L
(L) Q102	2E5	29A
(L) Q103	2F6	29A
(L) Q104	2F6	29A
(L) Q105	2G7	29A
(K) Q102	2F6	66G
(K) Q103	2F6	66G
(K) Q104	2F6	66G
(K) Q105	2G7	66G

SEE NOTE 1

APP FIG. 3

(FS1)

KS-19220,L2 AMPLIFIER
(PRINTED WIRING BOARD ASSEMBLY)

APP FIG. 4

(FS1)

KS-19221,L1 AMPLIFIER
(PRINTED WIRING BOARD ASSEMBLY)

NOTES:
1. CIRCUIT BOARDS BEARING THE MARKING "SERIES E" ARE FURNISHED WITH 66G TRANSISTORS AND RESISTOR R117.

DRAWING ISSUE

1	M M ORIGINAL
2D	F CIR PWB DLY
3A	WEB DLY
4D	WEB DLY
5D	JIG DLY
6D	CRA DLY
7B	DLY

8B

KS-19219,L7 AMPLIFIER CIRCUIT (2) SD-99723-01-4

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SD-99723-01-4

CIRCUIT REQUIREMENTS

KS-19219,L1 AMPLIFIER CIRCUIT

APPARATUS				MECH REQT			CIRCUIT PREPARATION			TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT				REMARKS
DESIG	CODE	OPTION	FIG	REF FIG.	CONT PRESS.	ARM TRVL	BLOCK OR INSULATE	TEST CLIP DATA: CORN BAT	TEST CLIP DATA: CONN GRD			TEST WDG.	TEST FOR	AFTER SOAK MA.	TEST MA.	READJ MA.	
RELAY																
K1	U1460		1	322/SPL	H	59			T(K1)	GRD	1		0		22	20.5	

TEST NOTES:

1. BOTTOM SPRING COMBINATION SAME AS 324 EXCEPT WITH GROUNDED CLAMPING PLATE.

DRAWING ISSUE

1	MH
2	JJW LJB HAE DLV
3A	MEH DLV
4D	MEH DLV
5D	SCq
6D	CRA RWM

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KS-19219,L1 AMPLIFIER CIRCUIT | SD-99723-01-5

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DRAWING ISSUE

1	MH MVM DLV
5D	JJW LJB HAE DLV
3A	MEH DLV
4D	MEH DLV
5D	SCq
6D	CRA RWM CAY
7B	RWM

7B

KS-19219,L1 AMPLIFIER CIRCUIT (2) | SD-99723-01-5

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