

1978F SWITCH ZC OPT
1977L SWITCH ZC OPT (SEE NOTES 109 AND 206)
242P PLUG
345E JACK

CIRCUIT NOTES:

DESIG	AMP	POTENTIAL	ONE PER
	2	48V TALK	CKT
CD	1-1/3	-48	5 FIG. 5
BATTERY SYMBOL		VOLTAGE RANGE	
-48		44-52V	

FEATURE OR OPTION	PROVIDE	
	FIG. OR WRG	QUANTITY
ONE RING ROTARY HUNTING CONNECTOR ARRANGED FOR INWARD DIALING	1	1 PER CKT
FIRST AND INTERMEDIATE LINES OF A HUNTING GROUP	X	
CAMP-ON TO A BUSY LINE BY PBX ATTENDANT. SINGLE LINES OR LAST LINE OF A HUNTING GROUP ONLY.	NOT PROVIDED	Y, ZF
	AND ALL CALLED CONNECTING CIRCUITS WITHIN A CONNECTOR GROUP RETURN DISCONNECT SUPERVISION AND AT LEAST ONE CALLED CONNECTING CKT WITHIN A CONNECTOR GROUP DOES NOT RETURN DISCONNECT SUPERVISION	Z, A, ZF
DIAL TRANSFER	NOT PROVIDED	T, ZD
	PROVIDED AND BUSY LINE TRANSFER FEATURE IS NOT EQUIPPED	ZD
INWARD RESTRICTION (SEE NOTE 107)	PROVIDED AND BUSY LINE TRANSFER FEATURE IS EQUIPPED	ZE
	REQUIRED	S
CONNECTOR ARRANGED TO PREVENT TALKING OVER BUSY TONE	NOT REQUIRED	R
	NO	M
BUSY LINE TRANSFER	WHEN USED WITH 806B RINGING MACHINE (REMOVE J WRG)	K
	WHEN USED WITH 806C RINGING MACHINE (REMOVE K WRG)	J
INDICATION OF CAMP-ON	NOT PROVIDED	F
	PROVIDED	E
CAMP-ON DENIED TO A SPECIFIC LINE	3	ZA
CONNECTION TO TRAFFIC MEASUREMENT SYSTEM 1A	5	ZP

NETWORK VALUES			
NO.	CODE	RESISTANCE IN OHMS	CAPACITANCE IN UF
1	178A	150	1.0-1.0
2	179A	150	0.1
3	186D	270	0.425-0.575

CIRCUIT NOTES: (CONT)

CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION HAS FURN	SEE NOTE	USE IN CIRCUIT		
				STD	AM	ND
20	W OR V	W		V	W	
40	R OR S	R		R, S		
68	Q OR M	Q		M	Q	
	N, K OR J	NONE		N, K OR J		
70	H OR G	H		G	H	
	F, E OR B	F	102	F, E, OR B		
	A	A		A		
98	ZB OR ZC	ZB	109	ZC	ZB	
11AC	ZD OR ZE	ZC	102	ZD, ZE		
12B	ZF OR ZG	ZF	102	ZF, ZG		
	ZI OR ZJ	ZI		ZJ	ZI	
	ZK OR ZL	ZK		ZL	ZK	
	ZM	NONE		ZM		
13B	ZN, ZO	ZN		ZO	ZN	
	ZP	NONE	102	ZP		
15B	ZQ	NONE		ZQ		

105. WHEN CAPACITORS (T) AND (R) ARE PART OF A MULTI-UNIT CAPACITOR, UNITS (T) AND (R) SHALL BE BALANCED WITHIN 0.11 UF.
106. WHEN Y OPTION IS PROVIDED THE S LEAD SHALL BE CONNECTED TO THE S TERMINAL ON THE INDIAL AND LOCAL SELECTOR BANKS; WHEN Z OPTION IS PROVIDED THE S LEAD SHALL BE CONNECTED TO THE S TERMINAL ON THE INDIAL SELECTOR BANKS AND THE S1 LEAD SHALL BE CONNECTED TO THE S TERMINAL ON THE LOCAL SELECTOR BANKS.
107. WHEN INWARD RESTRICTION IS PROVIDED ON DID CALLS A SEPARATE CONNECTOR GROUP IS REQUIRED FOR COMPLETION OF LOCAL CALLS.
108. INSTALLER TO CUT APPROPRIATE STRAP IN ORDER TO OBTAIN DESIRED OPTION PER NOTE 102.
109. THE USE OF ZB APPARATUS (AND WIRING) IN THIS CKT HAS BEEN RATED MFR. DISC. AND IS SUPERSEDED BY ZC APPARATUS (AND WIRING) ON ISSUE 98. ZC APPARATUS INCLUDES A RON BREAK CONTACT NOT EQUIPPED WITH ZB APPARATUS. SEE EQUIPMENT NOTE 206 FOR FIELD MODIFICATION.

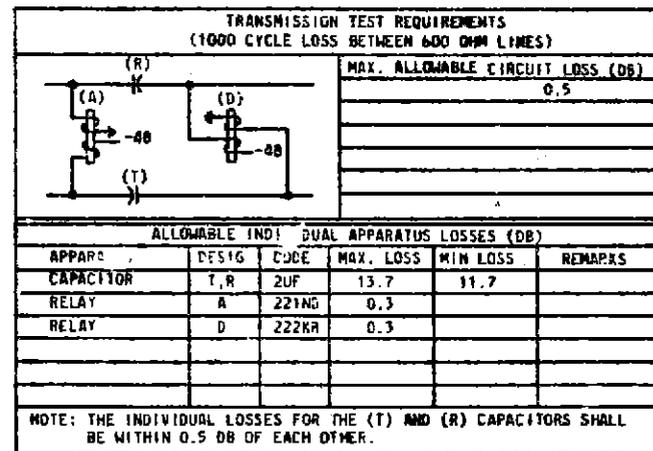
CKT FIG.	APP OR WIRING
1	Z ZA
2	Y ZB
3	X ZC
4	W ZD
5	V ZE
	T ZF
	S ZG
	R ZI
	Q ZJ
	ZK
	N ZL
	M ZM
	L ZN
	K ZO
	J ZP
	H ZQ
	G
	F
	E
	B
	A

WORKING LIMITS
MAX. EXT CKT LOOP - 15000
MIN INS RES - 15,000

- EQUIPMENT NOTES:
201. ALL SHELVES ARE WIRED UNIVERSAL FOR USE WITH CONNECTORS.
202. WHEN INTERCEPT SERVICE IS NOT DESIRED, THE LAST TERMINALS OF EACH LEVEL SHALL BE MADE BUSY.
203. T WIRING SHALL BE MADE ON THE SWITCH FRAME CONNECTOR SHELF ONLY.
204. WHEN CONNECTING CIRCUITS PROVIDE -48V, USE 3D AND 6D 1PM WIRE. WHEN CONNECTING CIRCUITS PROVIDE +10V, USE 3D AND 6D 1PM WIRE.
205. T WIRING SHALL BE PROVIDED BY THE WECO, THE INSTALLER SHALL REMOVE *T* WIRING WHEN A CONNECTOR APPLIQUE CIRCUIT IS PROVIDED.

FIELD MOD ADDITION	SWITCH TO BE MODIFIED		EQUIV MOD SWITCH	
	SWITCH CODE	OPT	SWITCH CODE	OPT
RON SPRINGS	1978F	ZB	1977L	ZC

206. FOR FIELD MODIFICATION: TO PROVIDE RON SPRINGS FURNISH KIT 0-179971 WHICH CONSISTS OF THE FOLLOWING ASSEMBLY PARTS:
P-138221 RON SPRING ASSEMBLY
P-251233 WASHERS (2)
P-252505 SCREWS (2)
P-284779 CAM ASSEMBLY
THE EQUIVALENT SWITCH CODE SHOULD BE STAMPED IN PLACE OF THE EXISTING CODE FOR MAINTENANCE PURPOSES AND JOB RECORDS SHOULD BE CHANGED TO SHOW THE EQUIVALENT SWITCH OPTION.
207. WHEN CAMP-ON DENIED IS TO BE PROVIDED, INSTALLER SHALL ORDER THE RESISTORS AND THEIR MOUNTING DETAIL PER J-58837AH-() AND WIRE PER FIG. 5 OF THIS DRAWING. THE CD FUSE IS PROVIDED ON THE FUSE AND ALARM PANEL ON THE J58837AH-() SHELF. CROSS CONNECT BETWEEN EACH LOWER TERMINAL OF THE RESISTORS AND EACH H PUNCHING AT THE BANK TERMINAL STRIP ASSOCIATED WITH A STATION LINE TO BE DENIED CAMP-ON.
208. USE OF THE 402B TONE GENERATOR IS RATED MFR DISC. ON ISSUE 13B AND IS REPLACED BY 402D TONE GENERATOR.



ISSUE	DATE	BY	REVISION
1	1	1	2-21-74
20	1	1	3-21-74
30	1	1	7-31-74
40	1	1	7-31-74
50	1	1	8-23-74
60	1	1	8-23-74
70	1	1	12-12-74
80	1	1	3-26-74
90	1	1	6-10-74
100	1	1	11-10-74
110	1	1	2-24-75
120	1	1	1-4-75
130	2B	1	9-9-75
140	3B	1	2-21-76
150	APPX 1B	1	12-10-75

WORKING DRAWING
REPRODUCED WITHOUT CHANGE
2-21-74 (MS)

J-58837CE
J58837AH
ED-65949-01
EQUIPMENT INFO

ISSUE
15B

1J07

PBX SYSTEMS
NO. 701B OR 711B
CONNECTOR CIRCUIT

ROTARY HUNTING
ONE RING
WITH OR WITHOUT DIAL TRANSFER
AND CAMP-ON BUSY STATION LINES

AT&T
STANDARD

SD-65949-01
6 SHEETS

BELL TELEPHONE LABORATORIES
INCORPORATED

FIG. 1
CONNECTOR

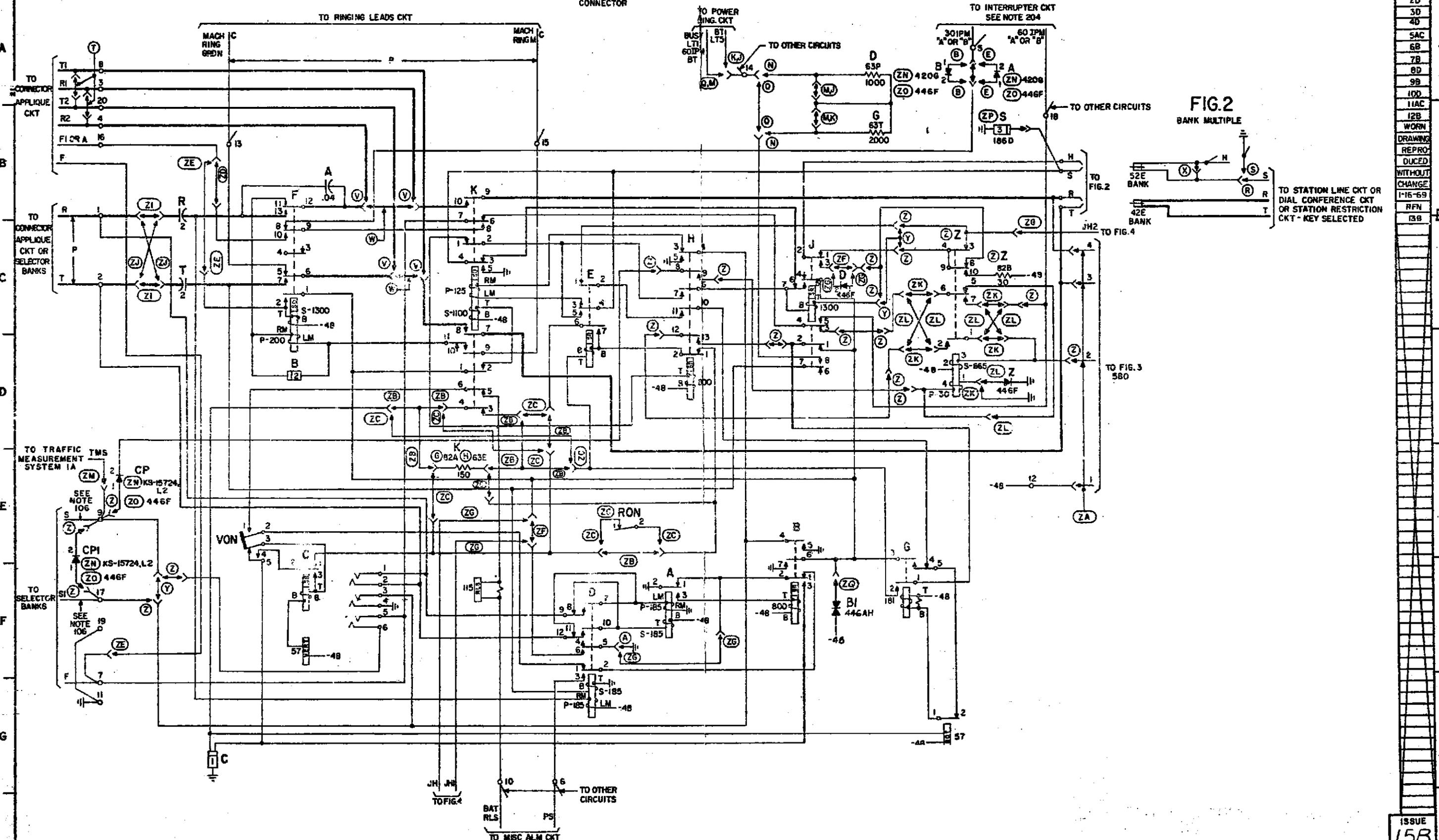
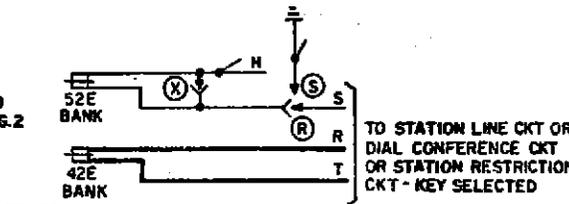


FIG. 2
BANK MULTIPLE



DRAWING ISSUE
1
2D
3D
4D
SAC
6B
7B
8D
9B
10D
11AC
12B
WORN
DRAWING REPRODUCED WITHOUT CHANGE 1-16-69
RFN
13B
ISSUE 15B

CIRCUIT REQUIREMENTS

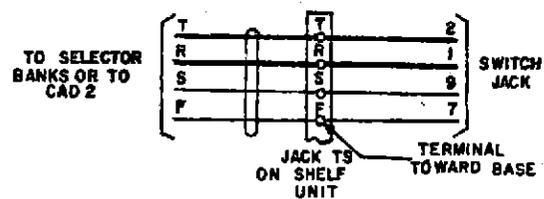
APPARATUS				MECH REQ			CIRCUIT PREPARATION				TEST SET		DIRECT CURRENT FLOW REQ				TIME REQ		REMARKS
DESIG	CODE	OPT	FIG. RESID.	BSP FIG.	CONT PRES.	ARM. TRVL.	BLOCK OR INSULATE	TEST CIP DATA		PREP	NOTE	TEST WDG.	TEST FOR	AFTER SOAK MA	TEST MA	READJ MA	TEST SEC	REAL SEC	
								CONN BAT.	CONN GRD.										
RELAYS																			
A	221ND		7-11	11			B	B(NO)	TST JK 2	TST JK 1	M	1/2/3	P/S	0	FS	15.1	14.8		
							B	B(NO)	TST JK 2	TST JK 1	M	3	P/S	NO	FS	13.9	14.4		
B	248D		15-4	504			27	2(A)		3(A)	GRD	4		0	FS	10.5	10		
								2(A)		3(A)	GRD	4/5		NO	FS	8.5	9		
			MIN						TST JK 1	TST JK 2	V-BR	5/6		H				333	
			1.5						TST JK 1	TST JK 2	V-BR	5		R				750	
C	221CL		S-4	10			12			3(B)	GRD	4		0	500	90	85		
										3(B)	GRD	4/5		NO	500	62	69		
									TST JK 1	TST JK 2	VM	5/7		H				100	
									TST JK 1	TST JK 2	VM	5		R				155	
D	222KR		S-2	44			16	(A)NO	7(F)	13(F)	M	8	P/S	0	FS	20.5	19.5		
								(A)NO	7(F)	13(F)	M	8	P/S	NO	FS	13.3	14.0		
E	221CJ		S-4	16			13			2(H)	GRD	4		0	500	90	85		
										2(H)	GRD	4/5		NO	500	62	69		
									TST JK 1	TST JK 2	VM	5/7		H				111	
									TST JK 1	TST JK 2	VM	5		R				174	
F	222H		S-4	72			27	11(B)K	11(F)	B/G	9/10	P	0	FS	21.5	20.5			
								11(B)K	11(F)	B/G	10	P	NO	FS	18.0	19.0			
									2(F)	GRD		S	0	FS	28.3	27			
									2(F)	GRD	11	S	NO	FS	20	21			
G	221BF		S-4	102			18	21(R)T	1(R)T	GRD	12		0	FS	130	120			
								21(R)T	1(R)T	GRD	12		NO	FS	80	85			
H	222HC		S-4	190			13	(J)(K)D	17(K)	GRD			0	FS	15.2	14.5			
								(J)(K)D	17(K)	GRD			NO	FS	10.1	10.6			
J	223C		S-4	205			14	6(H)		B/G	14/20		0	FS	12.7	12.1			
								6(H)		B/G	15/14/20		NO	FS	9.5	10			
K	224AA		S-4	227			29	4(E)	3(E)	BAT.	15/16	P	0		26.3	25			
								4(E)	3(E)	BAT.	16/18	P	NO		20.4	21.5			
									2B(K)	GRD		S	0	FS	35.6	34			
									2B(K)	GRD	17	S	NO	FS	20.4	21.5			
Z	225AE	Z	S-4	184			27	4WDG(Z)	1WDG(Z)	B/G	9/10	P	0		78.7	75			
								4WDG(Z)	1WDG(Z)	B/G	10	P	NO		50.4	53			
									3(Z)	GRD	21	S	0	FS	92.5	50			
									3(Z)	GRD	11/21	S	NO	FS	35.2	37			
ZA	AF168			46				8(ZA)	L(ZA)	U(ZA)	B/G		0		275	25			
													NO		20.9	22			

- TEST NOTES:
1. ARM. NEED NOT TOUCH CORE.
 2. MAKE CONTACT FOLLOW TEST MIN .008
 3. CONTACT SEPARATION TEST MIN.003.
 4. FOR USE WHEN TIME REQUIREMENTS ARE NOT APPLIED.
 5. FOR USE WHEN TIME REQUIREMENTS ARE APPLIED.
 6. TEST HOLD-1400 μ LOOP IN PULSING TEST SET.
 7. TEST HOLD-USE LEAK "A" IN PULSING TEST SET.
 8. TEST MIN 35 GRAMS ON CONTACTS 8-9 AND 11-12.
 9. CONTACTS 1-2 SHALL MAKE BEFORE SPRING 1 STRIKES THE BUSHING ON SPRING 4.
 10. REQUIREMENTS FOR SPRING 1-2 ONLY.
 11. CONTACTS 1-2 MAY MAKE AND CONTACTS 3-4 AND 5-6 MAY BREAK ON NON-OPR.
 12. CONTACT PRESSURE SPRINGS 4-5 TEST MIN 35 GRAMS.

13. AS PERMITTED BY SEQUENCE ANY TWO BREAK CONTACTS MAY BREAK ON NON-OPR.
14. CONTACT PRESSURE SPRINGS 6T-7T TEST MIN 10 GRAMS.
15. CONTACTS 1B-2B SHALL MAKE BEFORE SPRING 1B STRIKES THE BUSHING ON SPRING 4B AND BEFORE THE ARMATURE STUD STRIKES SPRING 2T.
16. REQUIREMENT FOR 1B-2B ONLY.
17. AS PERMITTED BY SEQUENCE ANY TWO BREAK CONTACTS MAY BREAK AND CONTACTS 1B-2B MAY MAKE.
18. SHORT CKT TEST JACKS 3-4.
19. SPRINGS 9-11 & 17-19 SHALL MAKE WHEN SWITCH IS REMOVED.
20. CONNECT GROUND TO 1(E) FOR OPTION Y OR TO 8(Z) FOR OPTION Z.
21. WHEN THIS CIRCUIT IS EQUIPPED WITH FIG. 3 (402 TYPE TONE GENERATOR) LEAD ON TERMINAL 2 OF THE TONE GENERATOR MUST BE DISCONNECTED TO PERFORM TEST.

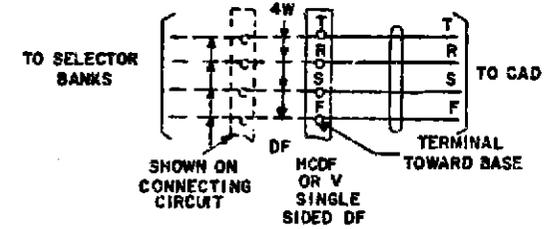
① CAD 1 (MFR DISC)
(FOR FIG.1)

CONNECTOR SHELF UNIT ARRANGED TO MOUNT ON SWITCH FRAME SWITCH JACKS



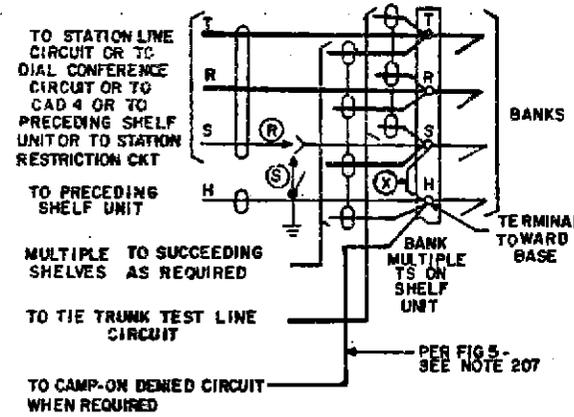
② CAD 2 (MFR DISC)

SWITCH JACKS CONNECTED THRU DISTRIBUTING FRAME



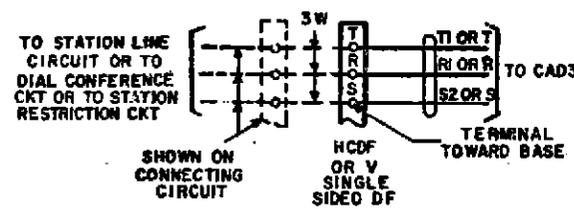
CAD 3

(FOR FIG.2)
CONNECTOR SHELF UNIT ARRANGED TO MOUNT ON SWITCH FRAME BANKS
SEE NOTE 202



CAD 4

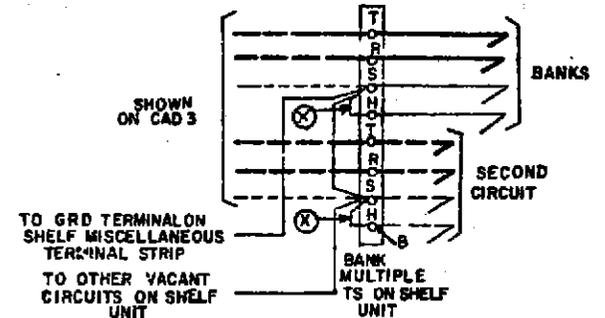
(FOR FIG.2)
BANK MULTIPLE CONNECTED THRU DISTRIBUTING FRAME



CAD 5

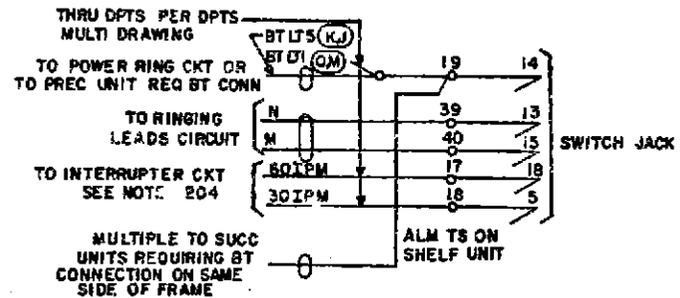
METHOD OF MAKING BUSY VACANT CONNECTOR TERMINALS NOT CONNECTED TO THE DISTRIBUTING FRAME AND LINE RELAYS. THE LAST TERMINALS OF EACH LEVEL CONNECTED TO AN INTERCEPT TRK
SEE NOTE 202

CONNECTOR SHELF MOUNTED ON SWITCH FR



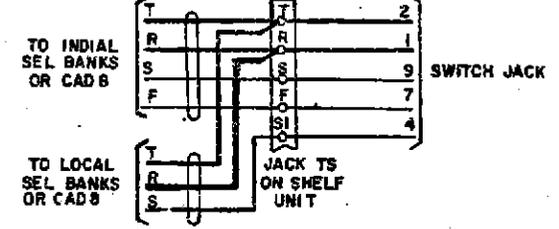
CAD 6

(FOR FIG.1)
SHELF UNIT ARRANGED TO MOUNT ON SWITCH FRAME MISCELLANEOUS LEADS



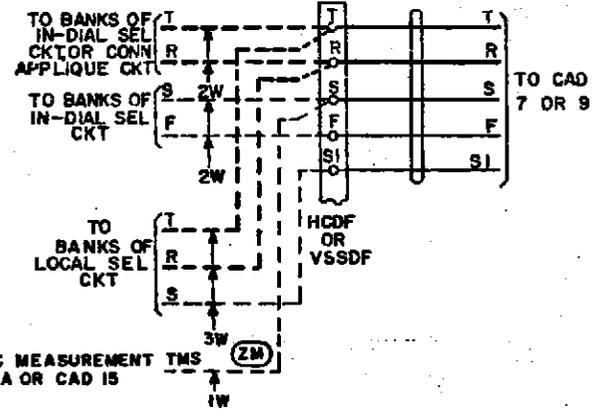
③ CAD 7 (MFR DISC)

CONNECTOR SHELF UNIT ARRANGED TO MOUNT ON SWITCH FRAME SWITCH JACKS



④ CAD 8

SWITCH JACKS CONNECTED THRU DISTRIBUTING FRAME



CONNECTOR CIRCUIT

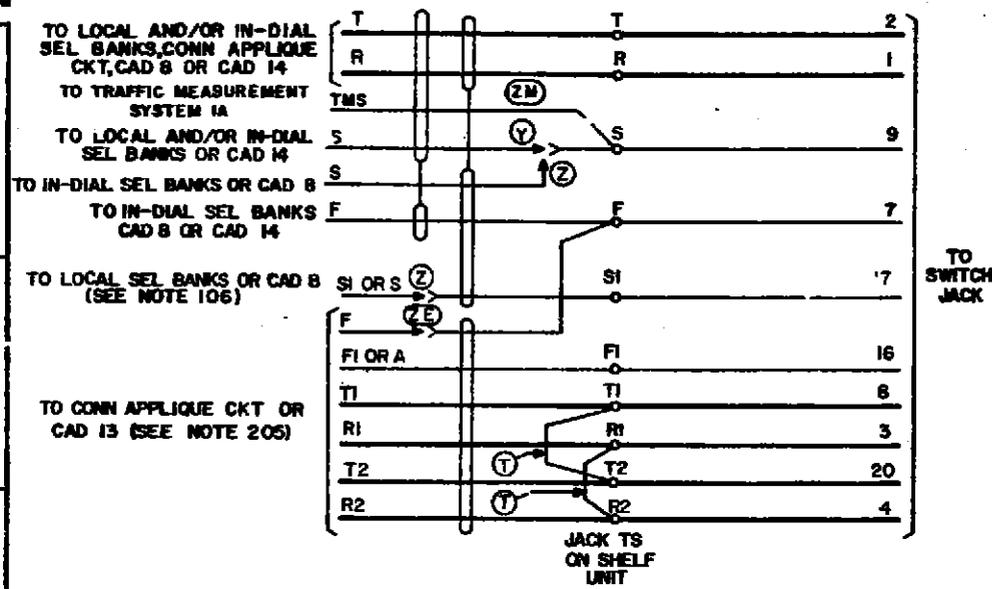
SD-65949-013

DRAWING ISSUE	DATE	BY
1		LAC
20		JBS
		POB
30		RS
		JBS
		PD
40		EMC
		BE
		FC
50		JH
		DTP
		FC
60		JH
		GE
		TEB
70		LHE
		TEB
		SP
80		LNE
		TEB
90		WPA
		SAK
		GFH
100		CEJ
		PJS
		SHE
		TEF
110		PJS
		RHP
120		R2
		MS
		RHP
WORN DRAWING REPRODUCED WITHOUT CHANGE 9-17-68		
CMJ		
13B		

SD-65949-013

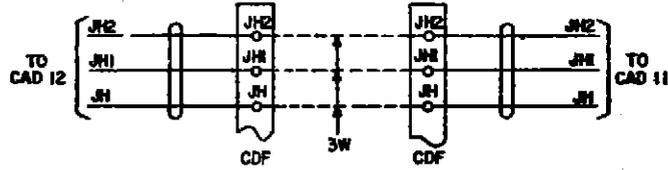
CAD 9

CONNECTOR SHELF UNIT ARRANGED TO MOUNT ON SWITCH FRAME SWITCH JACKS



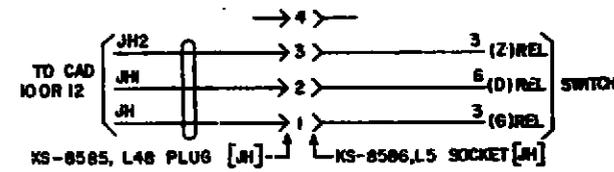
CAD 10

(FIG. 1)
(REQUIRED ONCE PER SWITCH)
SHOWING CROSS CONNECTIONS BETWEEN JOINT HOLDING CONTROL UNIT AND JOINT HOLDING CONTROL CABLE WHEN DISTRIBUTING FRAME IS USED



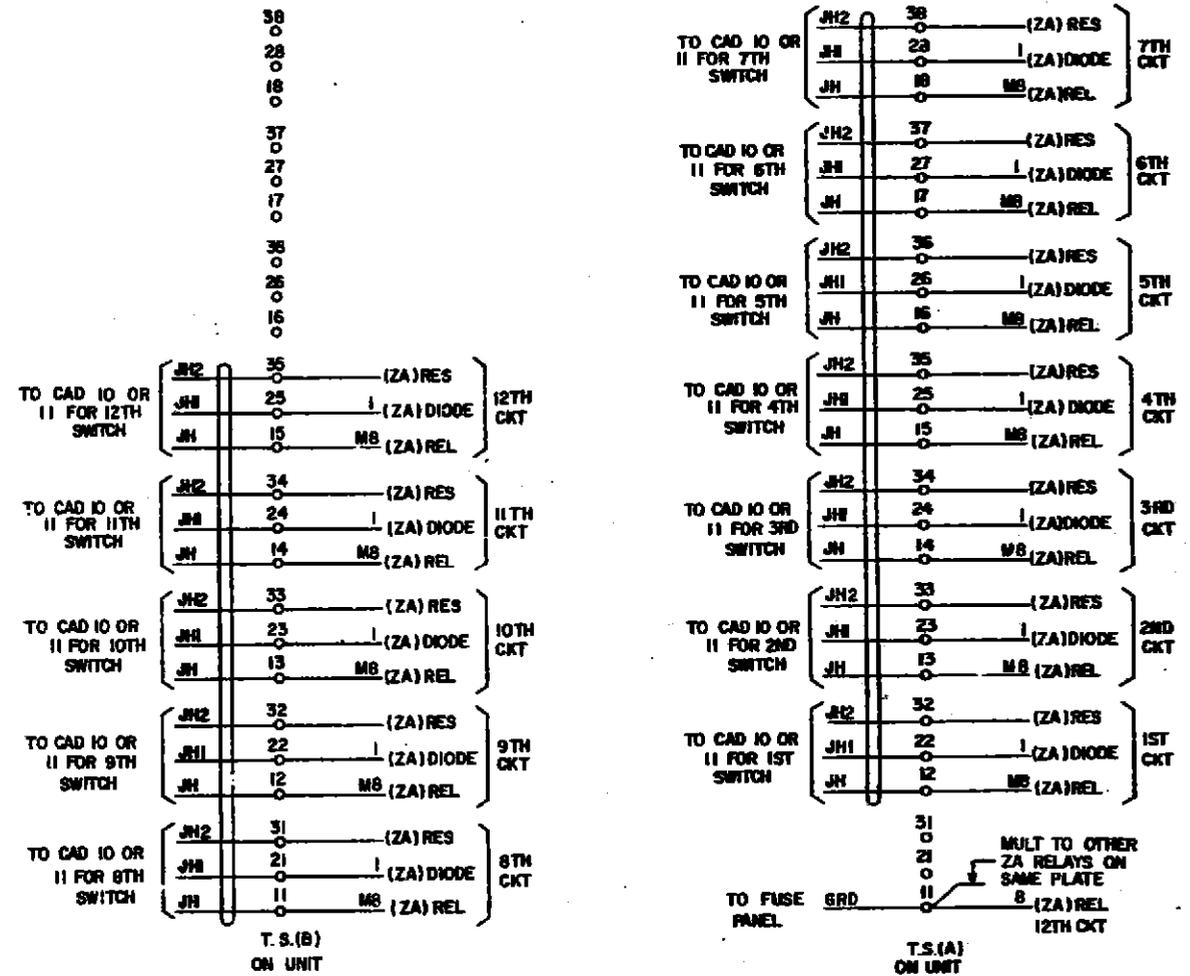
CAD 11

(FIG. 1)
(REQUIRED ONCE PER SWITCH)
CONNECTIONS TO PLUG ON JOINT HOLDING CONTROL CABLE AND SOCKET ON SWITCH



CAD 12

(FIG. 4)
JOINT HOLDING CONTROL UNIT



DRAWING ISSUE
2D
3D
4D
5AC
6B
7B
8D
9B
10D
11AC
12B
WORKING DRAWING PRODUCTION CHANGE WITHOUT CHANGE
1-8-69
ROZ
139

ISSUE 58