CIRCUIT DESCRIPTION

CD-1C605-01
ISSUE 2B
APPENDIX 3D
DWG ISSUE 5D
DISTN CODE 3N21

M

COMMON SYSTEMS
VOICE FREQUENCY TRANSMISSION
SWITCHED MAINTENANCE ACCESS SYSTEM
NO. 3A, 3B, AND 3C
TYPE 3 MAINTENANCE CONNECTOR

8

CHANGES

D. Description of Changes

D.1 Current Drain table is added.

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8

COMMON SYSTEMS
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CHANGES

B. Changes in Apparatus (Components)

B.1 Superseded	Superseded By
CR 1, 2, 3, 9 Diodes, 533C Diodes, App Fig. 2	CR 1, 2, 3, 9 Diodes, 533F Diodes, App Fig. 2

D. Description of Changes

D.1 Drawing rating is changed to Mfr Disc.

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CHANGES

B. Changes in Apparatus (Components)

B.1 Deleted

Loop Test T, R and T1, R1 Connector, 239A Jack, App Fig. 4

CR4, 6 Diode, 533A Diode, App Fig. 3

CR5, 7 Diode, 446N Diode, App Fig. 3

RV1, 2 and RV11, 21 Diode, 446AH Diode, App Fig. 3

RV1, 2 Relay, BF29 Relay, App Fig. 2

RV11, 21 Relay 312A Relay, App Fig. 2

B.2 Moved

Component	From App Fig.	To App Fig.
C1, 2 Capacitor	3	2
C3 Capacitor	4	2
CR1-3, 9, GT1, GT2 LT, SP1 and 2 Diode	3	3
CR8 Diode	4	3
R5 Resistor	4	2
R6 Resistor	4	3
T1, T2 Transformer	3	2

B.3

Superseded	Superseded By
CR1-3, 9 Diode, 533A Diode, App Fig. 2	CR1-3, 9 Diode, 533C Diode, App Fig. 2

B.4

Replaced	Replaced By
R5 Resistor, Unspecified, App Fig. 4	R5 Resistor, KS20289 L6C, 825 ohms App Fig. 4
CKT 1-24 Connector	CKT 1-24 Connector
950A Connector, App Fig. 1	950-type Connector, App Fig. 1
CR8 Diode, 485H Diode App Fig. 3	CR8 Diode, 485P Diode, App Fig. 3
R6 Resistor, KS8512 L17A, 75 ohms, App Fig. 3	R6 Resistor KS20616 L1A, 21.5k ohms, App Fig. 3

D. Description of Changes

D.1 ED drawing reference information is added to App Figs. 2, 3, and 4.

D.2 Table C (printed wiring board terminals) is added for CAD2.

D.3 Printed wiring board terminals are added to CAD3 and CAD4.

D.4 Lead designations EL, ML, ED, MD, and LO are corrected in CAD3.

D.5 TM relay contact type is corrected in App Fig. 2.

D.6 Notes 105 and 303 are added.

D.7 FS6 is changed completely.

F. Changes in CD Sections

Section II

F.1 Change paragraph 4.05 to read:

4.05 Operation of the SP1 relay performs a fire ax split on the T and R leads. Relay SP2 performs a similar function on the T1, R1 leads of the VF circuit accessed.

F.2 Delete paragraph 4.06.

F.3 Change paragraph 6.01 to read:

6.01 The CM1 and CM2 leads furnish control from the maintenance concentrator and control circuit to operate the splitting and the loop test relays (SP1, SP2, and LT).

Section III

F.4 Delete references to RV1 RV2, reversing, in paragraph 2.01, Relays.

F.5 Delete references to Loop Test TR and Loop Test T1R1 in paragraph 2.02, jacks.

F.6 Add after paragraph 4.01 (a):

(b) Maintenance Concentrator and Control Circuit - SD99500-01.

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TABLE OF CONTENTS

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit is an integral part of a switched maintenance access system (SMAS) of the No. 3 type. It provides through transmission connections or performs the switching function in those paths between the external maintenance concentrator and control circuit of the SMAS No. 3 and the 24 metallic noncarrier VF circuits.

2. GENERAL DESCRIPTION OF OPERATION

2.01 The multipin access connector (MAC) jacks provide normal through connections in the transmission paths of 24 metallic circuits. These jacks are not intended for patching. They are provided for maintenance access only. A cord reel from the appropriate manual access panel provides the necessary maintenance access.

2.02 This circuit is primarily designed to be used on a consolidated bay of office equipment utilizing the metallic facility terminal (MFT).

2.03 It provides through connections in the transmission paths of 24 unaccessed metallic VF circuits or provides remote access to any one (one at a time) of the 24 circuits for purposes of maintenance. The transmission path may be split in either direction (but not both simultaneously) for measurements which are equivalent to measurements at the VF patch bay to a high degree of accuracy. T and R may be reversed and T1 and R1 may be reversed. T and R may be looped with T1 and R1.

2.04 The circuit allows a special mark to be applied to any (or all) of the 24 VF circuits which should have minimum disruption.

2.05 The circuit provides a lockout indication to trunk circuits which have the lockout feature.

2.06 The circuit provides an alarm indication if more then one of the 24 circuits are accessed simultaneously.

SECTION II - DETAILED DESCRIPTION

1. MAC JACKS FS1

1.01 The MAC jacks provide normal-through connections in the transmission paths of 24 metallic circuits. Insertion of a plug from a cord reel breaks the transmission path and provides maintenance access to the transmission paths.

2. INTRODUCTION

2.01 The maintenance connector circuit is designed to be inserted into the transmission paths of 24 metallic VF circuits.

2.02 It provides through connection or remote access to the 24 metallic VF circuits. These 24 circuits constitute a maintenance bus group.

2.03 SMAS No. 3 has three versions: A, B, and C. They vary only in total circuit capacity. The basic circuit unit, the maintenance bus group of 24 VF circuits is the same in all cases. Its corresponding

basic equipment unit, the maintenance connector unit, is used in all cases in quantities as required.

2.04 A VF circuit which is part of a SMAS No. 3 system is identified by six digits, XXXXYY. The first four digits (0000-9999) identify the maintenance bus group or maintenance connector (one out of 10,000 for the largest or C version) with which the circuit is associated. The last two digits identify the particular VF circuit in the maintenance bus group of 24.

3. MAINTENANCE CONNECTOR FS2

UNACCESSED CONDITION

3.01 The connector circuit of FS2 in its unaccessed condition provides through connections in the transmission paths of 24 metallic VF circuits through the unoperated TM (1-24) relays. Note that one TM relay is provided per VF circuit (24 per maintenance bus group or per maintenance connector unit). The remainder of this circuit is functional only during access.

4. REMOTE ACCESS FS2 FS3

4.01 One external maintenance concentrator and control circuit may be multipled to the matrix portion of a maximum of ten matrix control circuits (ten maintenance connector circuits) with the restriction that these ten circuits must have the same first three digits in their maintenance bus identification.

4.02 The GTB and GTG leads from the external maintenance concentrator and control circuit are used to identify a specific maintenance connector unit. The GTB lead is a 1 out of 100 selection controlled by the first two digits of the maintenance bus number and the GTG lead is a 1 out of 100 selection controlled by the last two digits of the maintenance bus number. One, and only one, GT1 relay is between any pair of GTB and GTG leads.

4.03 The GT1 (gating) relay of selection circuit of FS3 is operated by the external maintenance concentrator and control circuit. The GT1 relay operates the GT2 (gating) relay. These are controlled from the external circuit by the first four digits (maintenance bus group number) of the circuit 6-digit identification. By means of the last 2 digits (circuit number) ground is applied from the external circuit through the gating relays, GT1 and GT2, to two of the eight A through H leads of FS3. The two grounds will select a particular RD( ) and TM on a 1 out of 24 basis. For example ground on leads B and H will put ground on leads a and b of the first device on the fourth dip. This provides ground to one side of the TM 13 relay and ground to turn on the relay driver RD13. Since the emitters of the circuit are tied to -22 volts relay TM13 will operate and locks through its own contact IM and alarm relay ALM contact 6B to leads HO, H, or H1. The A-H selection leads and the H or H1 lead are momentary (approximately 500 milliseconds) and after selection TM13 remains locked to the ground on lead HO until released under the control of the external maintenance concentrator and control circuit.

4.04 Operation of a TM( ) relay opens the T,R and T1,R1 leads in the accessed circuit.

4.05 Operation of the SP1 relay performs a fire ax split on the T and R leads. Operation of RV1 interchanges T,R and EL,MC leads from the external maintenance concentrator and control circuit and the VF circuit that is accessed. Relays SP2 and RV2 perform similar functions on the T1,R1 leads of the VF circuit accessed.

4.06 The LOOP TEST jacks T,R and T1,R1 provide a looped back transmission path through the operated LT relay for testing the test facilities at the maintenance line control panel (MCCP).

4.07 Transformers T1 and T2 provide monitoring at the MLCP when the TM( ) relay has been operated but the spliting function has not been performed.

5. SELECTION CIRCUIT FS3

5.01 The portion of this circuit in which a TM( ) relay is selected has been previously described.

5.02 Jacks J1 and J24 are located on the front panel of the maintenance connector and accept the plug-in diodes used to identify special circuits, ie, high priority circuits which must be subject to a minimum of disturbance. The diode is used to steer a ground from an operated TM( ) relay to an SC lead common to a maintenance connector. The SC lead is gated by the GT function during initial access.

5.03 Lead Y, also gated by the GT function, sends a class mark to the maintenance concentrator and control circuit.

5.04 Lead SZL sends an end mark to the maintenance concentrator and control circuit.

5.05 Lead ALM1 is an alarm lead ground indicating an alarm due to either the alarm relay operating or GT1 operated and GT2 failed to operate.

6. MAINTENANCE BUS CIRCUIT FS4

6.01 The CM1 and CM2 leads furnish control from the maintenance concentrator and control circuit to operate the splitting, reversing, and loop test relays (SP1, SP2, RV11, RV1, RV21, RV2, and LT).

7. LOCKOUT CIRCUIT FS5

7.01 This circuit provides a through path for a lockout control lead to an accessed circuit on a 1 out of 24 basis LO leads 1 to 24 must only be connected to trunk circuits that are capable of single lead lockout control and sensing.

8. ZENER SUPPLY FS6

8.01 The zener supply supplies the -22 volt power required for the relay driver (RD) integrated circuits.

9. ALARM AND BUSY CHECK FS7

9.01 A standard check chain of all 24 TM relays provides a busy indication ground on lead TPB if only one TM relay is operated or an alarm if more than one TM operates. The aLM relay in operating

(a) Releases any TM relays operated

(b) Sends an alarm signal to the minor bay alarm

(c) Sends an alarm signal to the maintenance concentrator and control circuit.

(d) Lights LED ALM providing a visual alarm on the front of the maintenance connector.

9.02 The operated ALM relay will be released by the operation of the ALM RLS key.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 The busy hour current drain for battery plant is 0.005 amp.

1.02 The ambient temperature shall be between +40 and +125°F. Somewhat impaired performance may be expected outside of this range. In no case shall the ambient temperature exceed 140°.

2. FUNCTIONAL DESIGNATIONS

2.01 Relays

Designation	Meaning
ALM	Alarm
GT1 GT2	Gating
LT	Loop Test
RV1 RV2	Reversing
SP1 SP2	Splitting
TM( )	Trunk Maintenance

2.02 Jacks

Designation	Meaning
GT1 Test	Gating Test
Loop Test TR	Loop Test
Loop Test T1R1	Loop Test

2.03 Key

Designation	Meaning
ALM RLS	Alarm Release

2.04 Lamps

Designation	Meaning
ALM	Alarm
TPB	Test Position Busy

2.05 Leads

Designation	Meaning
ALM1, ALM2, ALM2R	Alarm
CM1, CM2	Control Matrix
GTB	Gating Battery
GTG	Gating Ground
HO	Hold
LO LO 1.24	Lockout
SC	Special Circuit
SEL	Select Magnet
TPB	Test Position Busy

3. FUNCTIONS

3.01 Provides circuitry to gain access to monitor and split transmission leads of 4-wire metallic VF trunks.

3.02 Provides through connections in the transmission paths in the nonaccessed condition.

3.03 Provides access from a remote position to 1 out of 24 circuits of a maintenance group bus through a relay driver IC matrix on a 2 out of 8 basis.

3.04 Provides on-site maintenance access through multipin access connector (MAC) jacks.

3.05 Provides for loop testing of the maintenance access circuitry from a maintenance line control panel.

3.06 Provides for a mark to be furnished to one or more of the 24 circuits of the maintenance bus group to designate it as a special circuit which must be subjected to a minimum of disturbance.

3.07 Provides a local alarm if more than one TM relay operates.

3.08 Provides a signal to the concentrator that the particular maintenance connector is busy.

4. CONNECTING CIRCUITS

4.01 When this circuit is listed on a key sheet, the connecting information thereon is to be followed

(a) Maintenance Connector Application Schematic - SD-1P138-01.

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5. MANUFACTURING TESTING REQUIREMENTS

5.01 This circuit shall be capable of performing in accordance with all the specifications specified in this circuit description and of meeting all the requirements of the Circuit Requirements Table.

SECTION IV - REASONS FOR REISSUE

B. Changes in Apparatus (Components)

B.1 Added

All of App Fig. 2, 3, and 4

D. Description of Changes

D.1 This issue adds the maintenance connector function to the circuit.