

CB10A

AUTOMATIC CHECK-BACK SYSTEM



**Meter and Control
Business Department**

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Protection & Control Division
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These instructions do not purport to cover all details or variations in equipment nor provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

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	Power Supply	GEK-99218
	Remote Checkback	GEK-90707
	Auxiliary Relay	GEK-99322

REMOTE CHECKBACK EQUIPMENT TYPE CB10A P3

GENERAL

The automatic REMOTE CHECKBACK equipment Type CB10A P3, when used in conjunction with the MASTER CHECKBACK equipment, provides the means for automatically testing equipment such as the G. E. AUDIO TONE EQUIPMENT TYPES NN40A AND NS40A, to verify proper equipment operation.

The equipment consists of a SHELF, a POWER SUPPLY, a REMOTE CHECKBACK, and an AUXILIARY RELAY module. Detailed descriptions of these modules are included in subsequent sections of this INSTRUCTION BOOK.

This equipment was originally designed for use with CS26/27A/B BLOCKING CARRIER, therefore some of the labeling of indicators is not directly related to this application. For example, the indicator LED'S are labeled "FULL POWER" and "REDUCED POWER" whereas they are used for CHANNEL 1 and CHANNEL 2 respectively when used with NN40A or NS40A TONE EQUIPMENT.

SHELF

The SHELF serves to mount the modules, provide the necessary interconnections between the modules, and provide customer connection points.

The 3 Rack-Unit high (5.25") steel shelf is designed for flush mounting in standard EIA 19-inch racks or cabinets. Auxiliary brackets (19B218789P008, Qty. 2) are available for semi-flush mounting in shallow racks. The front door is removable. Barrier-type terminal boards, similar to GE EB-25 boards, which will accommodate wire sizes AWG 22 through AWG 10, are mounted on the printed-circuit mother-board backplane.

POWER SUPPLY

The POWER SUPPLY module occupies slot J1 in the shelf and is a DC-DC Converter. Power supplies are available for use with station batteries of 48, 110, 125, 220, and 250 Volts DC. This Converter, with battery surge and transient protection, provides +/-12VDC to operate the other modules in the shelf. A power ON-OFF switch, short-circuit protection, an alarm relay, and a fuse are part of this module. Test points on the front of the module can be used to monitor the +/-12VDC outputs.

REMOTE CHECKBACK

The REMOTE CHECKBACK module occupies slot J3 in the shelf.

Automatic testing of the system is provided by the timing and memory circuits of the MASTER CHECKBACK module. The time interval between tests is programmable from 1 to 255 hours in one-hour steps.

A test sequence can also be initiated from the REMOTE CHECKBACK, by depressing the front-panel "TEST INITIATE" pushbutton.

When applied with the TYPES NN40A or NS40A TONE EQUIPMENTS, the "FULL POWER" tests are used to verify CHANNEL ONE and the "REDUCED POWER" tests are used to verify CHANNEL TWO operation. Up to three remote terminals can be tested, and six LED'S mounted on the front panel indicate failures of either CHANNEL ONE or CHANNEL TWO for each remote.

AUXILIARY RELAY

The AUXILIARY RELAY module, located in slot J2 of the shelf, contains three mercury-wetted relays with separate inputs and outputs. The relays provide isolation between the CHECKBACK EQUIPMENT and the TONE EQUIPMENT. Front-mounted LED'S indicate which relays are energized.

APPLICATION

As the CHECKBACK EQUIPMENT actually sends a single-channel TRIP signal to verify proper channel operation, it should be applied only with DUAL channel DIRECT TRIP, or with PERMISSIVE relaying schemes.

Tone OPTIONS such as "REVERT TO SINGLE CHANNEL" or "TRIP WINDOW" cannot be used in conjunction with the CHECKBACK system.

If "TRIP HOLD" is used in the optional tone LOGIC MODULE, the tone "TRIP RECEIVED" signal used as the CHECKBACK "RECEIVE" input must be taken directly from the tone RECEIVER, rather than from the output of the LOGIC circuit.

The TONE EQUIPMENT must be equipped with the AUXILIARY RELAY module. Two of the relays on this module are employed to supply the "TRIP RECEIVED" signals to the CHECKBACK. This is necessary because the TONE EQUIPMENT heavy-duty output relays are not fast enough to follow the CHECKBACK signals.

OPERATION

The MASTER CHECKBACK test cycle can be initiated by the BUILT-IN CLOCK, by the front-panel "TEST INITIATE" push-button, by the operation of the supervisory "TEST INITIATE" relay, or by receipt of a "REQUEST FOR TEST" signal from a REMOTE CHECKBACK module.

The test cycle is composed of nine segments of one second each, as follows:

1. During the first segment, the MASTER CHECKBACK sends eight pulses of 32 msec. width at 16 cps on channel one. This initiates the REMOTE CHECKBACK test sequence.
2. The REMOTE CHECKBACK is programmed to respond with eight pulses on channel one in the second, third, or fourth time segment. These are designated as "FULL POWER 1, 2, or 3".
3. During the fifth segment, the MASTER CHECKBACK sends four pulses of 32 msec. width at 16 cps on channel two.
4. The REMOTE CHECKBACK is programmed to respond with four pulses on channel two in the sixth, seventh, or eighth time segment. These are designated as "REDUCED POWER 1, 2, or 3".
5. The ninth and final segment is used by the MASTER CHECKBACK to initiate alarms, initiate the automatic re-test function, or (in the event of a successful test) reset all circuits.

NOMENCLATURE SELECTION GUIDE

CHECKBACK SHELF

CB10A 04 P 1

TYPE

- 1 MASTER CHECKBACK-STANDARD
- 2 MASTER CHECKBACK-CS26/27B
- 3 REMOTE CHECKBACK-STANDARD
- 4 REMOTE CHECKBACK-CS26/27B
- 5 DUAL REMOTE-STANDARD
- 6 DUAL REMOTE-CS26/27B
- 7 MASTER CHECKBACK-CS26/27A
- 8 REMOTE CHECKBACK-CS26/27A
- 9 DUAL REMOTE-CS26/27A

POWER SUPPLY

- N NONE (NOTE 1)
- P BUILT-IN POWER SUPPLY

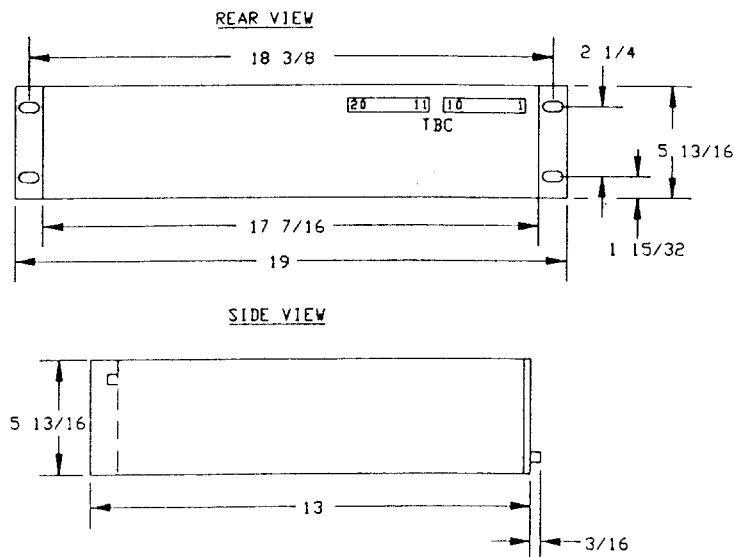
STATION BATTERY

- 04 48VDC
- 11 110VDC
- 12 125VDC
- 22 220VDC
- 25 250VDC

NOTES:

1. POWER SUPPLY "N" CAN BE USED ONLY WITH TYPES 1, 3, AND 5 WHEN USED IN CONJUNCTION WITH GE TYPE 40 TONE EQUIPMENT.

CHECKBACK EQUIPMENT



OUTLINE DIAGRAM-0286A2941

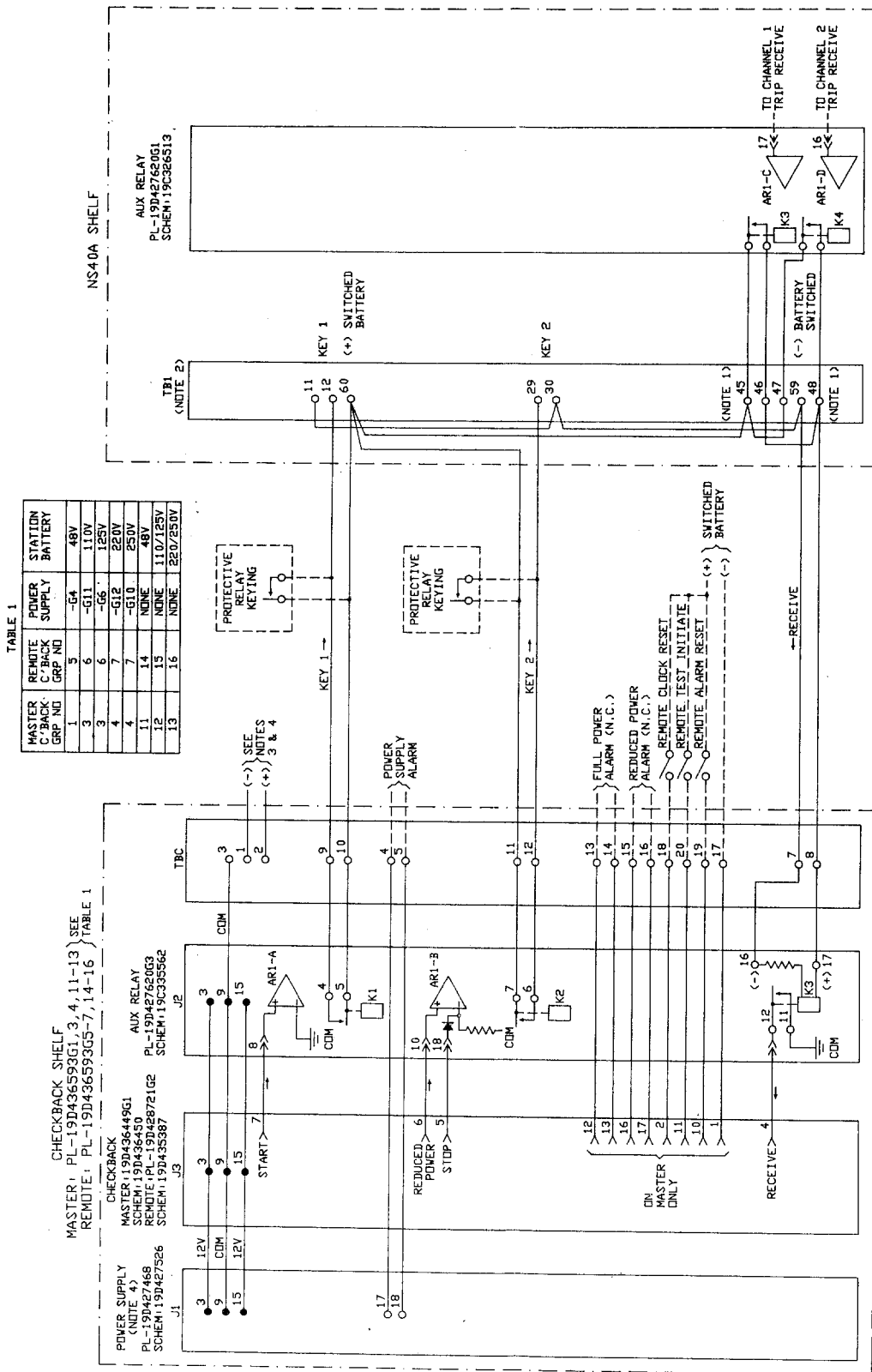


TABLE 1

MASTER C-BACK GRP NO	REMOTE C-BACK GRP NO	POWER SUPPLY	STATION BATTERY
1	5	-G4	48V
3	6	-G11	110V
4	7	-G6	125V
4	7	-G12	220V
11	14	NONE	250V
12	13	NONE	110/125V
13	16	NONE	220/250V

CHECKBACK SHELF
 MASTER: PL-19D436593G1, 3, 4, 11-13 (SEE REMOTE: PL-19D436593G5-7, 14-16) TABLE 1
 CHECKBACK
 MASTER: 19D436449G1
 Schem: 19D43645D
 PL-19D427468
 Schem: 19D4358721G2
 PL-19D427526
 Schem: 19D435887

AUX RELAY
 PL-19D427620G3
 Schem: 19C335662

- NOTES:
- 1) TB1 TERMINAL NUMBERS 45, 46, 47, 48 ARE NUMBERS 39, 40, 65, 66 RESPECTIVELY WHEN LOOP TEST MODULE IS INCLUDED IN NS40A EQUIPMENT. THIS IS USED, REFER TO DRAWING 19D436555 FOR ALTERNATE TB2 TERMINAL NUMBERS.
 - 2) TB1 AND -2 CONNECT TO STATION BATTERY FOR GROUPS 1 & 3 - 7 AND TO THE +12V, -12V POINTS ON THE NS40A BACKPLANE FOR GROUPS 11 - 16.
 - 3) POWER SUPPLY NOT INCLUDED IN GROUPS 11 - 16.

JUMPER CONNECTION CHART

BOARD LOCATION	MASTER	REMOTE	AUX RELAY
JUMPER CONNECTION (FUNCTION ARRAY) FAW	A B C D E F G H I J K	A B C D E F G H I J K	A B
	2-3 2-3 1-2 1-2 1 2 3 4 5 6 2-3 2-3 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2	1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2 1-2	1-2
	4 2 9 11 13 15 17 OFF ON DN OFF ON DN 4 5 7 2 3	9	

■ 1-2 FOR 110 - 250V
 ■ 2-3 FOR 48V

SYSTEM DIAGRAM-19C335802 SH. 4

**SHELF ASSEMBLY
Remote Checkback**

Assembly Drawing No:

19C335803G5 48 VDC
19C335803G6 110/125 VDC
19C335803G7 220/250 VDC

Consists of:

Backplane Asm.-19D436577G5 48 VDC
 -G6 110/125 VDC
 -G7 220/250 VDC
Case Asm.-19C335651G3
Door Asm.-19B230622G2

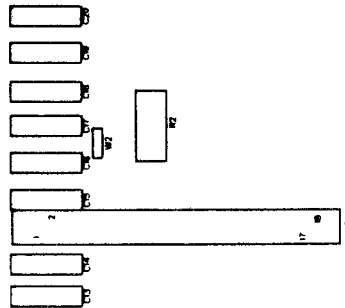
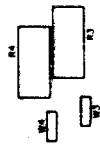
The Remote Checkback Shelf consists of a keyed, slotted chassis that holds three plug-in card-type modules, each equipped with 18 contacts that mate with contacts mounted on the backplane on the rear of the chassis.

All groups of the backplane contain two 10-point barrier-type terminal boards, similar to GE EB-25 boards, which will accommodate wire sizes AWG 22 through AWG 10, and the SWC capacitors (C1, C2).

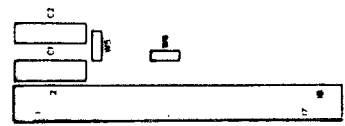
The 48 VDC version (-G5) contains component W1, which is a zero-ohm resistor. In the 110/125 VDC version (-G6) and the 220/250 VDC version (-G7), W1 is replaced by resistor R1.

<u>ITEM</u>	<u>IDENTIFICATION NUMBER</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
C1,C2	0246A9028P472	CAP., 4700PF, 3KV	
W1	0246A9141P001	RESISTOR, 0 OHM	
R1	0246A9125P302	RESISTOR, 3.0K OHM, 2W	(IN -G6 ONLY)
R1	0246A9125P622	RESISTOR, 6.2K OHM, 2W	(IN -G7 ONLY)

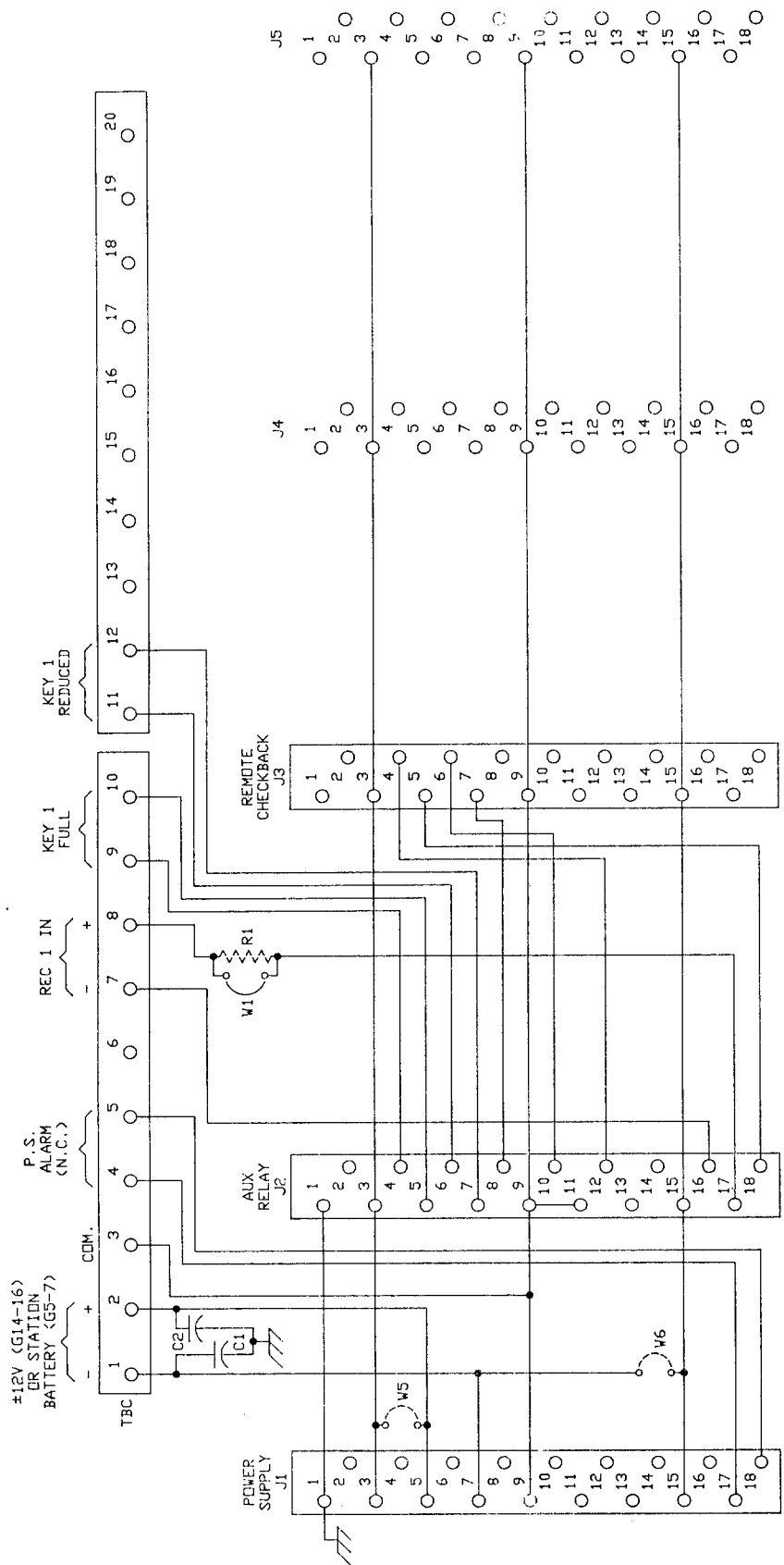
PARTS LIST-19D436577G5, -G6, -G7



OR



BACKPLANE OUTLINE-19D436576



NOTES:
 1) C1, C2 ARE .0047µfd, 3KV.
 2) J1 NOT INSTALLED IN GROUPS 14-16.
 3) POWER SUPPLY ALARM IS OPEN DURING NORMAL OPERATION

GROUP	R1	W1	W5	W6	APPLICATION
5		0.Ω			CSE6/27B, 48-250V, STD 48V
6	3.0K				STD 125V
7	6.2K				STD 250V
14		0.Ω			STD 48V, NO POWER SUPPLY
15	3.0K	0.Ω			STD 110/125V, NO POWER SUPPLY
16	6.2K	0.Ω			STD 220/250V, NO POWER SUPPLY

REMOTE CHECKBACK
 19D436577

SCHEMATIC DIAGRAM-19B230657 Sh. 2

**TYPE NS40A
POWER SUPPLY
PL-19D427468G 2, 4, 6,
10-12**

DESCRIPTION

The Power Supply module provides the conversion from the DC battery voltage to the regulated +12 VDC. Different Group Numbers are used for different battery voltages:

<u>Group</u>	<u>Battery Voltage</u>
2	24 VDC
4	48
6	125
10	250
11	110
12	220 VDC

OPERATION

Refer to Schematic Diagram 19D427526 which is included in this instruction.

The input voltage is applied to the converter through a 2-pole switch S1. This switch also provides a switched battery output. The positive input is fused (F1) and the negative input includes a reverse voltage protection diode (D54). An input filter (T2, C9, C11 and C12) attenuates noise from the power source to the power supply and vice-versa.

The DC-DC converter (A1) is a fixed frequency (20 kHz) variable pulse width regulator. Integrated circuit AR3 generates a 20 kHz square-wave with a duty cycle of 90%. Flip-flop U2 alternates the power pulse between power transistors Q6 and Q11. Transistors Q2 through Q5 and Q7 through Q10 interface the CMOS gates U1-C and U1-D with the power transistors.

Secondary winding 9 and 10 of T1 provides the supply voltage for the control circuits plus the voltage control loop. These secondary voltage pulses are rectified by diodes D4 and D5, and integrated by resistor R47 and capacitor C3. Integrated circuit AR2 senses when this voltage has reached a predetermined level and switches the output pulse OFF.

Integrated circuit AR1 provides short circuit protection by sensing the emitter current of Q6 and Q11 through resistor R24, and switching the output pulse OFF when the emitter current exceeds a predetermined level. This circuit also limits the in-rush current when the power supply is first turned ON.

Transistor Q12 prevents gate U1-A from switching ON until the supply voltage for the control circuits reaches its normal level through resistor R31.

Secondary winding 4 and 5 of T1 provides the negative bias voltage to switch power transistors Q6 and Q11 OFF.

Variable resistor R8, ± 12 VDC OUTPUT LEVEL ADJ, is used for adjusting the output to ± 12 VDC.

The ± 12 VDC output is rectified by diodes D9 through D12 and filtered by inductors L1 and L2 and capacitors C14, C18 and C19.

The alarm circuit switches ON when the output voltage (3/C - 15/S) reaches 23 VDC and OFF if the output voltage drops to 17 VDC. Form C alarm contacts are provided.

NOMINAL OPERATING CHARACTERISTICS

1. Input Voltage:

- a. Group 2 21 VDC to 28 VDC at 600 mA max.
- b. Group 4 42 VDC to 56 VDC at 300 mA max.
- c. Group 6 103 VDC to 142 VDC at 125 mA max.
- d. Group 10 210 VDC to 280 VDC at 10 mA max.
- e. Group 11 96 VDC to 124 VDC at 125 mA max.
- f. Group 12 192 VDC to 248 VDC at 80 mA max.

2. Output voltage:

- a. +12 \pm 1 VDC, 500 mA max.
- b. -12 \pm 1 VDC, 500 mA max.

3. Low Voltage Alarm: form C contacts, 100 VA

- a. Pick-up 23 VDC max.
- b. Drop-out 17 VDC min.

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION	GROUP NUMBER AND QUANTITY						
			1	2	3	5	6	7	
	19D427383G001 REV#B	DC-DC CONVERTER							
	19D427383G002 REV#C	DC-DC CONVERTER							
	19D427383G003 REV#C	DC-DC CONVERTER							
	19D427383G005 REV#C	DC-DC CONVERTER							
	19D427383G006	DC-DC CONVERTER							
	19D427383G007	DC-DC CONVERTER							
AR1	19A134379P001	LIN. OP-AMP RCA CA3130T	1	1	1	1	1	1	1
AR2	19A134379P001	LIN. OP-AMP RCA CA3130T	1	1	1	1	1	1	1
AR3	19A134379P001	LIN. OP-AMP RCA CA3130T	1	1	1	1	1	1	1
C1	5496267P003	CAPACITOR	1	1	1	1	1	1	1
C2	4029003P020	CAP.	1	1	1	1	1	1	1
C3	5493367P8200J	CAP. 8200PF 5% MICA	1	1	1	1	1	1	1
C4	5493367P1000F	CAP.	1	1	1	1	1	1	1
C5	5496267P005	CAPACITOR	1	1	1	1	1	1	1
C6	5496267P010	CAP 22MFD 15V TANT.	1	1	1	1	1	1	1
C7	5496267P010	CAP 22MFD 15V TANT.	1	1	1	1	1	1	1
C8	5490825P003	CAP 10K PFD 2000VDC	1	1	1	1	1	1	1
C9	19A115028P159	CAP 0.47MFD 400VDC 20%				1			1
C9	5493132P012	CAP 50MFD 250V	1	1	1	1	1	1	1
C11	5490825P003	CAP 10K PFD 2000VDC	1	1	1	1	1	1	1
C12	5490825P003	CAP 10K PFD 2000VDC	1	1	1	1	1	1	1
C13	0246A9006P181	CAP 180 PFD 500VDC 5%	1	1	1	1	1	1	1
C14	5493132P015	CAP 1000MFD 40V	1	1	1	1	1	1	1
C18	5496267P011	CAPACITOR	1	1	1	1	1	1	1
C19	5496267P011	CAPACITOR	1	1	1	1	1	1	1
C20	4029003P008	CAP 1000PF 500V MICA	1	1	1	1	1	1	1
D6	4037822P001	RECTIFIER - 1N4004G	1	1	1	1	1	1	1
D7	4037822P001	RECTIFIER - 1N4004G	1	1	1	1	1	1	1
D8	4037822P001	RECTIFIER - 1N4004G	1	1	1	1	1	1	1
D9	0246A9420P015J	DIODE RGP15J	1	1	1	1	1	1	1
D10	0246A9420P015J	DIODE RGP15J	1	1	1	1	1	1	1
D11	0246A9420P015J	DIODE RGP15J	1	1	1	1	1	1	1
D12	0246A9420P015J	DIODE RGP15J	1	1	1	1	1	1	1
L1	19B218975G003	COIL	1	1	1	1	1	1	1
L2	19B218975G003	COIL	1	1	1	1	1	1	1
Q1	19A116755P001	NPN TRANS 2N3947	1	1	1	1	1	1	1
Q2	19A116755P001	NPN TRANS 2N3947	1	1	1	1	1	1	1
Q3	19A115562P002	TSTR, SM5561 BI	1	1	1	1	1	1	1
Q4	19A115300P002	TSTR NPN 60V 2N3053 BI	1	1	1	1	1	1	1
Q5	19A115562P002	TSTR, SM5561 BI	1	1	1	1	1	1	1
Q6	19A115923P002	TRANSISTOR BI	1	1	1	1	1	1	1
Q6	19A134690P001	TRANS. NPN ST1-720				1			1
Q7	19A116755P001	NPN TRANS 2N3947	1	1	1	1	1	1	1
Q8	19A115562P002	TSTR, SM5561 BI	1	1	1	1	1	1	1
Q9	19A115300P002	TSTR NPN 60V 2N3053 BI	1	1	1	1	1	1	1
Q10	19A115562P002	TSTR, SM5561 BI	1	1	1	1	1	1	1
Q11	19A115923P002	TRANSISTOR BI	1	1	1	1	1	1	1
Q11	19A134690P001	TRANS. NPN ST1-720				1			1
Q12	0246A9214P3251	2N2907A TRANSISTOR BI	1	1	1	1	1	1	1
R1	0246A9105P102	RES 1K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R2	0246A9134P2212	RES 22.1KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R2	0246A9134P2742	RES 27.4KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R3	0246A9134P1213	RES 121KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R4	0246A9134P1213	RES 121KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R5	0246A9105P102	RES 1K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R6	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	1
R8	19A116559P107	POT 25K OHM 1/2W LIN	1	1	1	1	1	1	1
R9	0246A9134P3162	RES 31.6KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R11	0246A9105P622	RES 6.2K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R12	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R13	0246A9134P6191	RES 6.19KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R14	0246A9134P3742	RES 37.4KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R15	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	1
R16	0246A9134P3571	RES 3.57KOHM 1/4W 1% MTL	1	1	1	1	1	1	1
R17	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	1
R18	0246A9105P123	RES 12K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R19	0246A9105P513	RES 51K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R20	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R21	0246A9105P512	RES 5.1K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R22	0246A9102P101	RES 100 OHM .5W 5%	1	1	1	1	1	1	1
R23	0246A9102P201	RES 200OHM .5W 5%	1	1	1	1	1	1	1
R24	19B209022P003	RES 0.33 OHMS 5% 2W	1						
R24	19B209022P011	RES 0.68 OHMS 5% 2W		1					
R24	19B209022P021	RES 1.8 OHMS 5% 2W			1		1		1
R24	19B209022P127	RES 3.3 OHMS 10% 2W				1			1
R25	0246A9105P123	RES. 12K OHM 1/4W 5% CRN	1	1	1	1	1	1	1

Figure 1 (PL-19D427383)
DC/DC Converter Parts List

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION	GROUP NUMBER AND QUANTITY						
			1	2	3	5	6	7	
R26	0246A9105P513	RES 51K OHM 1/4W 5% CRN	1	1	1	1	1	1	
R27	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1	1	1	1	1	
R28	0246A9105P512	RES 5.1K OHM 1/4W 5% CRN	1	1	1	1	1	1	
R29	0246A9102P101	RES 100 OHM .5W 5%	1	1	1	1	1	1	
R30	0246A9102P201	RES 200OHM .5W 5%	1	1	1	1	1	1	
R31	19A116479P2152K	RES 1.5KOHM 10% 2W FLPRF	1				1		
R31	19A116479P2153K	RES 15KOHM 10% 2W FLPRF			1			1	
R31	19A116479P2512K	RES 5.1KOHM 10% 2W FLPRF		1					
R31	19A116479P4303K	RES 30.0KOHM 10%4W FLPRF				1		1	
R32	19A116559P109	POT 250KOHM 1/2W LIN	1	1	1	1	1	1	
R42	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	
R43	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1	1	1	1	1	
R44	19A116479P2131K	RES 1300HM 10% 2W FLPRF		1					
R44	19A116479P2331K	RES 3300HM 10% 2W FLPRF			1		1		
R44	19A116479P2680K	RES 68 OHM 2W 10%	1					1	
R44	19A116479P2681K	RES 6800HM 10% 2W FLPRF				1			
R45	19A116479P2131K	RES 1300HM 10% 2W FLPRF		1					
R45	19A116479P2331K	RES 3300HM 10% 2W FLPRF			1		1		
R45	19A116479P2680K	RES 68 OHM 2W 10%	1					1	
R45	19A116479P2681K	RES 6800HM 10% 2W FLPRF				1		1	
R46	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1	1	1	1	1	
R47	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	
R48	0246A9134P1782	RES 17.8KOHM 1/4W 1% MTL	1	1	1	1	1	1	
R49	0246A9134P2432	RES 24.3KOHM 1/4W 1% MTL				1			
R49	0246A9134P2942	RES 29.4KOHM 1/4W 1% MTL	1				1	1	
R49	0246A9134P3242	RES 32.4KOHM 1/4W 1% MTL			1				
R49	0246A9134P3482	RES 34.8KOHM 1/4W 1% MTL		1					
R50	0246A9134P5112	RES 51.1KOHM 1/4W 1% MTL	1	1	1	1	1	1	
T1	19B229227G001	COIL	1						
T1	19B229227G002	COIL		1					
T1	19B229227G003	COIL			1				
T1	19B229227G010	COIL					1		
T1	19B229227G011	COIL						1	
T1	19B229227G014	COIL						1	
T2	19B221725G001	CHOKE	1	1	1	1	1	1	
U1	19A134097P302	INT. CKT CMOS	1	1	1	1	1	1	
U2	19A134097P323	INT CKT	1	1	1	1	1	1	
VR1	0246A9403P6R2	ZENER 6.2V 5% 400MW	1	1	1	1	1	1	

Figure 1 (PL-19D427383)
DC/DC Converter Parts List, continued

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION	GROUP NUMBER AND QUANTITY						
			2	4	6	10	11	12	
	19D427468G002 REV#03	POWER SUPPLY							
	19D427468G004 REV#04	POWER SUPPLY							
	19D427468G006 REV#04	POWER SUPPLY PCB ASM							
	19D427468G010 REV#03	POWER SUPPLY							
	19D427468G011 REV#01	POWER SUPPLY PCB ASM							
	19D427468G012 REV#01	POWER SUPPLY							
A1	19D427383G001	DC-DC CONVERTER RV#B	1						
A2	19D427383G002	DC-DC CONVERTER RV#C		1					
A3	19D427383G003	DC-DC CONVERTER RV#C			1				
A3	19D427383G006	DC-DC CONVERTER						1	
A5	19D427383G005	DC-DC CONVERTER RV#C					1		
A5	19D427383G007	DC-DC CONVERTER							1
C51	0246A9028P682	CAP 6800PF CERAMIC RV#1	1	1	1	1	1	1	1
C52	0246A9028P682	CAP 6800PF CERAMIC RV#1	1	1	1	1	1	1	1
D51	0246A9418P206	LED GREEN	1	1	1	1	1	1	1
D53	0246A9427P350A	TRANSORB 300V					1		1
D53	0246A9427P5654A	TRANSORB 64V	1	1					
D53	0246A9427P5663A	TRANSORB 145V			1			1	
D54	0246A9407P5626	DIODE	1	1	1	1	1	1	1
F1	1R16P001	FUSE SIM/312.500					1		1
F1	1R16P003	FUSE SIM/312001 (1 A)			1			1	
F1	1R16P005	FUSE (2 A)		1					
F1	1R16P007	FUSE	1						
K51	19B209598P001	REL 24VDC 600 OHMS 10%	1	1	1	1	1	1	1
Q51	19A115300P002	TSTR NPN 60V 2N3053	1	1	1	1	1	1	1
R51	19A116479P2221K	RES 220OHM 10% 2W FLPRF	1	1	1	1	1	1	1
R52	0246A9103P131	RESISTOR	1	1	1	1	1	1	1
R53	0246A9105P102	RES 1K OHM 1/4W 5% CRN	1	1	1	1	1	1	1
R54	0246A9134P86R6	RES	1	1	1	1	1	1	1
R56	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	1
R57	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1	1	1	1	1	1
S1	0246A9987P001	SW DPST	1	1	1	1	1	1	1
VR51	0246A9403P6R2	ZENER 6.2V 5% 400MW	1	1	1	1	1	1	1

Figure 2 (PL-19D427468)
NS40A Power Supply Parts List

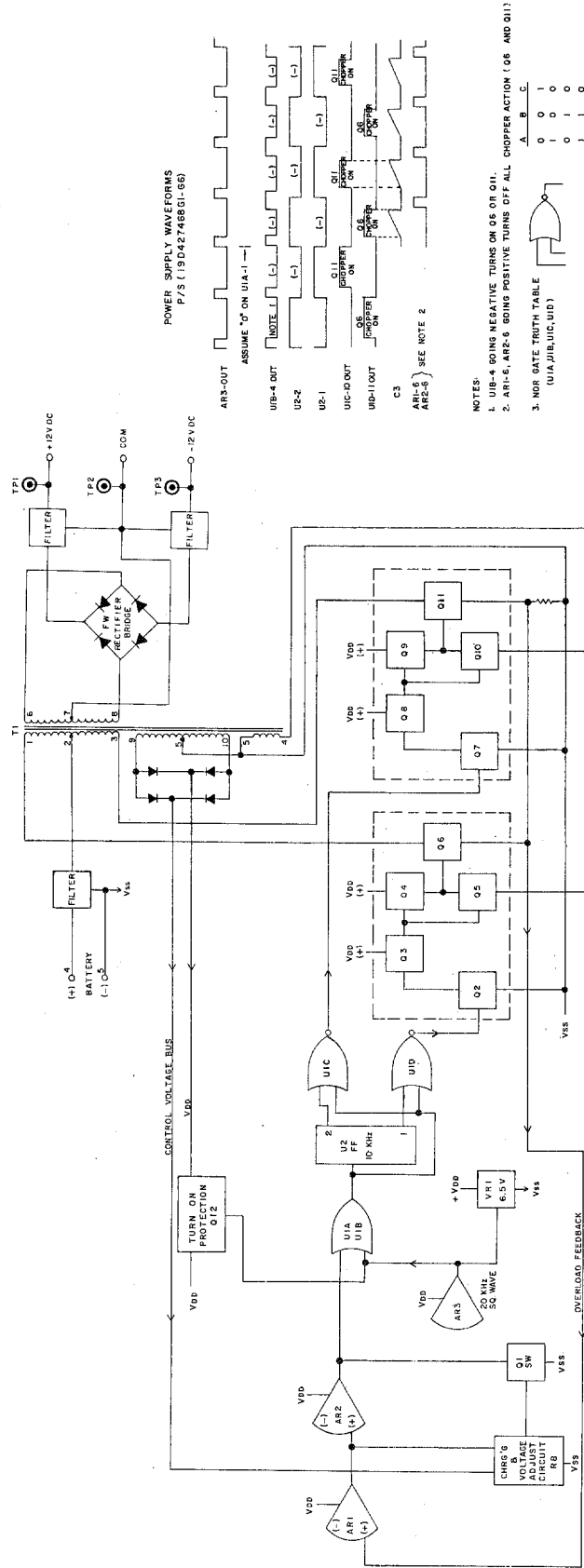
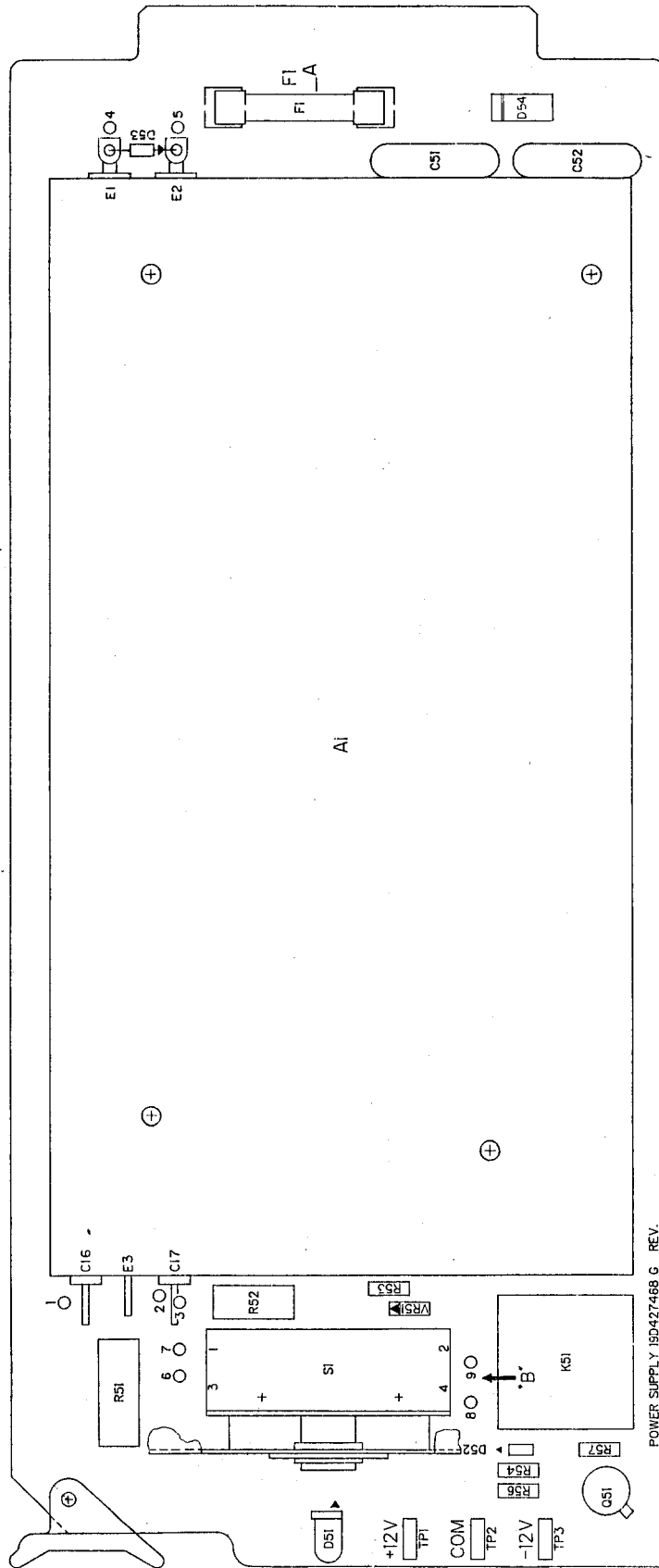


Figure 3 (19D434354 [1]) Functional Block Diagram
Type NS40A Power Supply



* Figure 4 (19D427468, Sh.2 [2]) Pictorial Diagram
Type NS40A Power Supply

* Revised since last issue

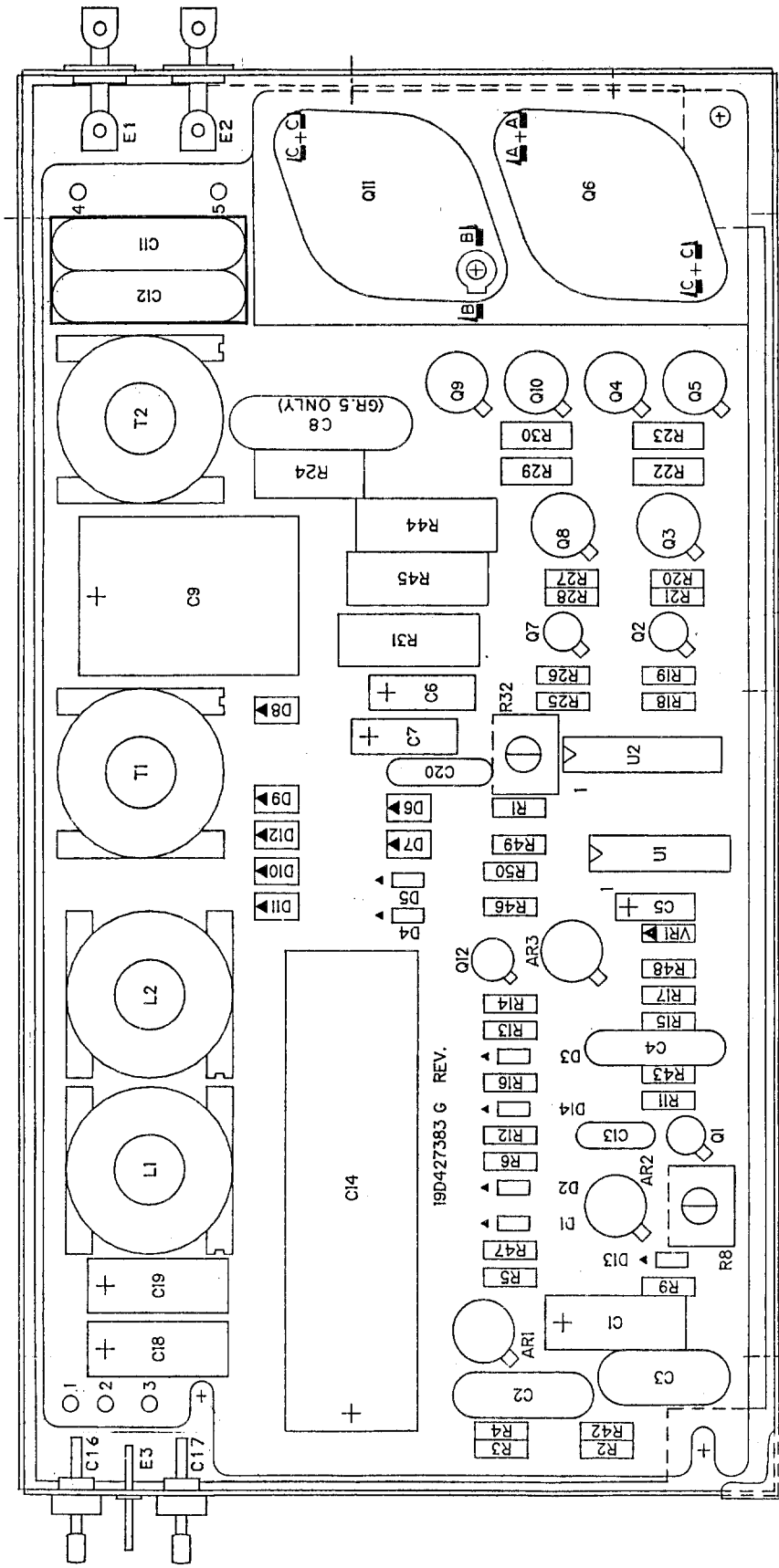
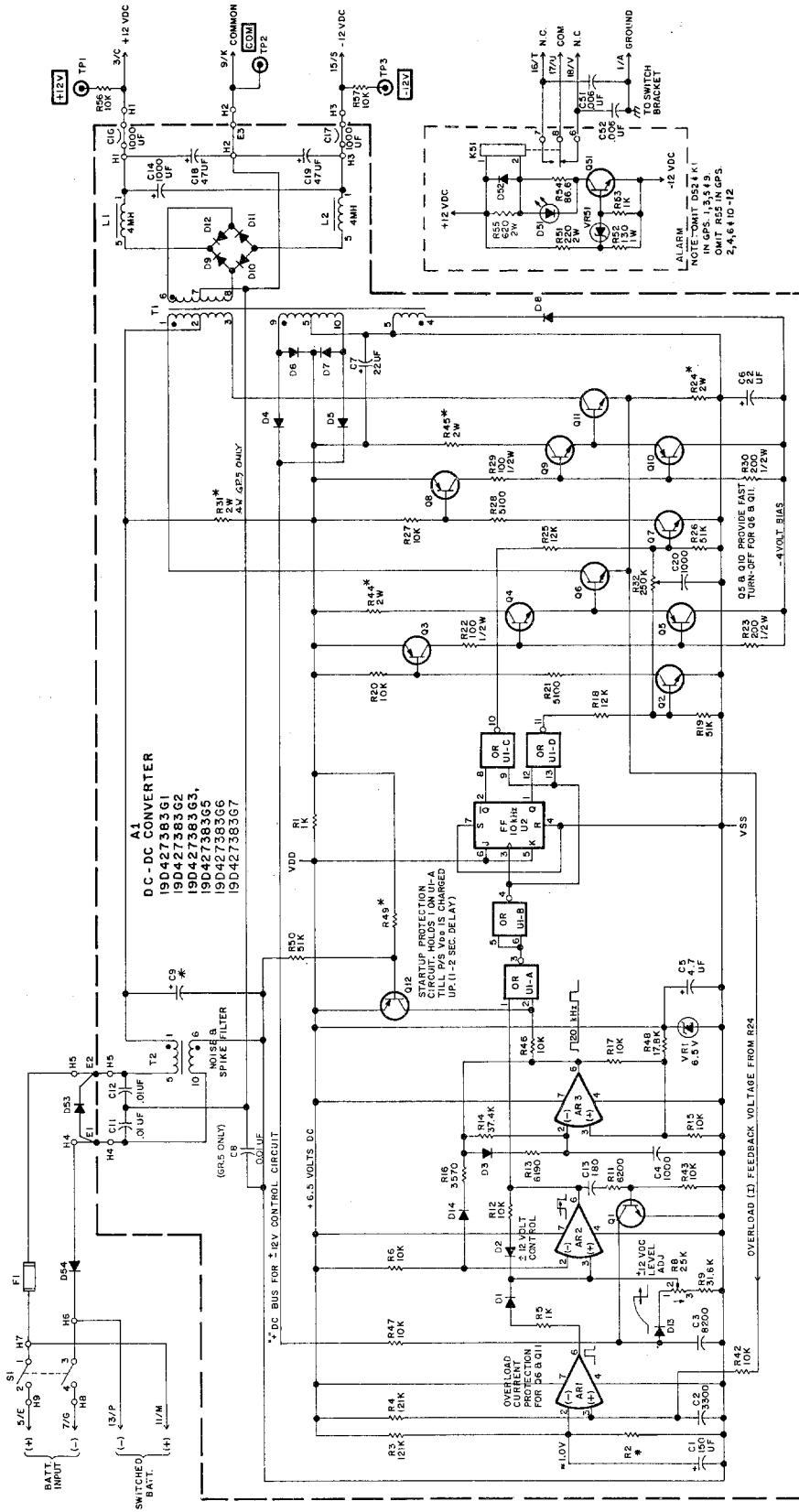


Figure 5 (19D427383 Sh.1 [13]) Pictorial Diagram
DC-DC Converter PL-19D427383G



ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED. CAPACITORS ARE IN MICROFARADS UNLESS FOLLOWED BY UF. MICROFARADS UNLESS FOLLOWED BY M. INDUCTORS OR INDUCTANCES UNLESS OTHERWISE SPECIFIED.

TYPE 40 POWER SUPPLY
 (24 VOLT) 19D427468 G1-G2,
 (48 VOLT) 19D427468 G3-G4,
 (125 VOLT) 19D427468 G5-G6,
 (100 VOLT) 19D427468 G7-G10,
 (220 VOLT) 19D427468 G11

UI PIN 7 - VSS
 UI PIN 8 - VSS
 UI PIN 9 - VDD

* A1 DC-DC CONVERTER	19D427383	R24	R31	R44	R45	R2	C3
INPUT GROUP	R45	R24	R31	R44	R45	R2	C3
24 VDC	1	29.4K	33	1500	68	221K	50UF
48 VDC	2	34.8K	68	5100	150	221K	50UF
110 VDC	3	32.4K	18	15K	330	221K	50UF
125 VDC	4	35.4K	18	15K	330	221K	50UF
220VDC	7/9	24.5K	33	30K	680	224K	47UF

Figure 6 (19D427526 [14]) Schematic Diagram Type 40 Power Supply PL-19D427468G

TYPE CS28A CHECKBACK (REMOTE) PL-19D428721G2

Schematic 19D435387

DESCRIPTION

The Remote Checkback Module responds to the signal sent by the Master Checkback by sending a signal to the Master Unit during its preassigned time slot. All the timing signals are controlled by a crystal oscillator. When the signal from the Master Checkback is detected, the clock is started.

Normally, each remote uses two time slots, (one for a full power test and the other for a reduced power test) and three remotes may be tested by the Master Checkback. In special applications of more than three remotes some remotes may be assigned only one time slot (see SPECIAL APPLICATIONS). Each segment or time slot of the test is a one second interval.

A manual test switch on the remote unit will generate a signal to the master unit that is recognized as a command to switch to the test mode. This allows a checkback test to be manually initiated at any of the remote sites.

Full and reduced power alarm lights allow the checkback test to be observed at any remote site. A checkback disable input stops any test in progress and resets all circuits.

OPERATION

Refer to the Schematic Diagram and Pictorial Diagram which are included in this section of this manual.

The 32,768 Hz frequency at the output of crystal oscillator AR1 is divided down to 16 Hz at Pin of U1 and down to 1 Hz at Pin 6 of U2. Counters U1 and U2 are inhibited from counting by NOR gate U3-D until a test signal is detected from the Master Checkback.

Input pulses from the Receiver will switch AR2. The output of AR2 is connected to

Bandpass Filter AR3-A and Transistor Switch Q7. As the pulses are received, Q7 causes the alarm lights to flash at a 16 Hz rate.

The 16 Hz pulses are detected by AR3-B and applied to clock input of counter U11 through inverter AR3-C. Timing circuit AR3-D is switched LOW by the first pulse and allows U11 to count the pulses. If a pulse is delayed or missing AR3-D will switch positive and reset counter U11. This prevents random pulses from counting up to the desired number. When counter U11 reaches 8, Pin 9 switches to a 1, setting Flip-Flop U12-B.

This starts counter U14 and when it reaches its predetermined count, Pin 1 momentarily switches to a 1 and this sets Flip-Flop U4-A. Flip-Flop U4-A switches a 1 to Pin 5 of NAND gate U6-B and Pin 12 of NOR gate U3-D. It also applies a 1 to Flip-Flop U5-A and this Flip-Flop is set on the next clock pulse. U3-D switches to a 0 and clock U1 and U2 is started. The 1 Hz clock signal is applied to counter U8 through inverter U3-A and NOR gate U3-B. Jumper B selects the time slot that the remote reports back in at full power and Jumper C selects the time slot that the remote reports back in at reduced power. Pin 2 of counter U8 switches to a 1 during the first period of the 1 Hz clock. When Jumper B is in the 1-2 position, NAND gate U6-B is switched 0 and this gates the 16 Hz pulses through NOR gate U3-C to the STOP output. The output pulses are counted by U7 and when they reach 8, Pin 11 of U7 switches to a 1, resetting Flip-Flop U4-A. Since Flip-Flop U5-A is set, U3-D remains at 0 and the clock continues to run.

At the start of the first time period, Pin 2 of U8, will also set Flip-Flop U16-A, unless jumper D is in the 1-2 position. With jumper D in the 2-3 position, the incoming pulses will flash full power alarm light #1 and will be switched OFF by the 8 pulse detector output U14, Pin 1 through NAND gate U15-A and inverter U15-B.

During the second 1 Hz clock period, remote #2 will report back and the full

power alarm light #2 will be flashed by the 8 incoming pulses and will be switched OFF by the 8 pulse detector through NAND gate U15-C and inverter U15-D.

The above sequence is repeated by remote #3, except with full power alarm light #3, during the third 1 Hz clock period.

At the start of the fourth 1 Hz clock period, the Master Checkback sends 4 pulses at 16 Hz and Pin 10 of counter U8 releases the inhibit on Flip-Flop U4-B. The four pulses are detected by U3-B and when counter U11 reaches 4, Pin 10 switches to a 1 setting Flip-Flop U12-A. Flip-Flop U12-A releases counter U13 and when it reaches its predetermined count, Pin 1 switches to a 1, setting Flip-Flop U4-B. Flip-Flop U4-B switches to a 1 at Pin of NAND gate U6-A.

When jumper C is connected to position 1-2, at the start of the fifth 1 Hz clock period, Pin 1 U8 switches U6-A to 0 and this gates the 16 Hz pulses to the STOP output through NOR gate U3. When counter U7 reaches 4, Pin 1 of U7 switches to a 1 and resets U4-B. At the start of the period U6-A also switches REDUCED POWER, ON, through inverter U6-C. Reduced power is switched off when U4-B resets.

When jumper G is in the 1-2 position, the 4 incoming pulses will flash Reduced Power Alarm Light #1 and then it will be switched OFF by the 4 pulse detector output U13, Pin 1 through NAND gate U19-A.

During the sixth 1 Hz clock period, remote #2 will report back and the reduced power alarm light will be flashed by the 4 incoming pulses and will be switched OFF by the 4 pulse detector through NAND gate, U19-C and inverter U19-D.

The above sequence is repeated by remote #3, except with the reduced power alarm light #3, during the seventh 1 Hz clock period.

At the start of the eighth 1 Hz clock period, Pin 9 of U8 switches to a 1, which resets all circuits, except the alarm light circuits, ending the test.

NOMINAL OPERATING CHARACTERISTICS

1. Power Requirements:
 - +12 VDC, 65 mA
 - 12 VDC, 65 mA
2. Oscillator Frequency (TP1); 32,768 Hz
3. Outputs: Stop, Start and Reduced Power
 - a) OFF: -6 VDC
 - b) ON: +6 VDC
4. Inputs:
 - a) Checkback Disable:
 1. OFF: -6 VDC
 2. ON: +6 VDC
 - b) Input:
 1. OFF: >3.5 VDC
 2. ON: <0.5 VDC
5. Pulse Frequency (TP-2-During Test): 16 Hz
6. Time Slots: 1 sec.

SPECIAL APPLICATIONS

As previously stated each remote (up to three) is normally strapped to respond in both a full power time slot (8 pulses in time slots 2,3 or 4) and in a reduced power time slot (4 pulses in time slots 6, 7 or 8). When it is desired to test more than three remote stations, two or more stations may be programmed to respond in only the full power time slot or in the reduced power time slot. With six time slots available (2, 3, 4, 6, 7 and 8) up to six remotes may be used. Units assigned to time slots 2, 3 and 4 will respond with eight pulses at full power and units assigned time slots 6, 7 and 8 will respond with four pulses at either full or reduced power level. This

special response is accomplished by adding or deleting jumpers W1, W2 and W3. A standard unit (which responds in both a full power and a reduced power time slot) has W1 and W3 installed (W1 and W3 are "zero-ohm" resistors). Modification for response in only one time slot are as follows:

1. Respond only in full power time slot.
 Remove W2. Select time slot with jumpers B and C (Jumper C will not produce an output but must be installed for proper operation).
2. Respond only in reduced power time slot at reduced power level.
 Remove W1. Select time slot with jumper B and C. (Jumper B will not produce an output but must be installed for proper operation).
3. Respond in only reduced power time slot but at full power level.
 Remove W1 and W2. Install W3 (use W1, W2 or solid wire for W3). Select time slot with jumpers B and C (Jumper B will not produce an output but must be installed for proper operation).

The Master Checkback will indicate an alarm for failure of time slots 2, 3 or 4 as "Full Power 1, 2 or 3" respectively and failure of time slots 6, 7 or 8 as "Reduced Power 1, 2 or 3" respectively.

TABLE I
 TYPICAL CHECKBACK (REMOTE)
 TEST POINT READINGS

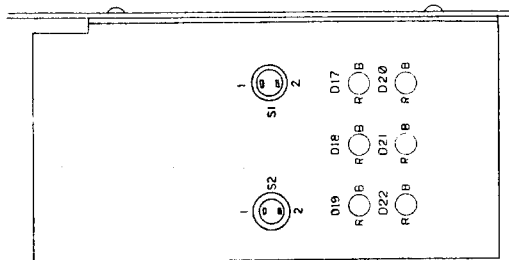
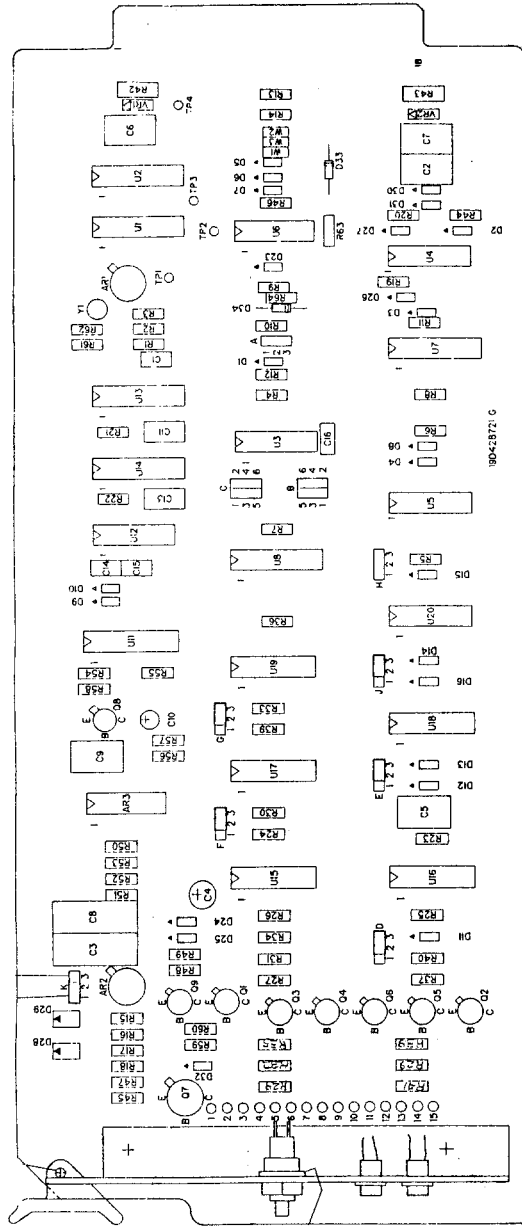
<u>Receiving Normal Input Signal Level from Master, Normal Strapping</u>	
Test Point	Reading
TP-1	Square Wave @ 32.768 Hz
TP-2	Square Wave @ 16 Hz
TP-3	Square Waves @ 1 Hz Amplitude approx. 15 Volts peak-to-peak
<u>FULL POWER TEST</u>	
Pin 4 (Input)	8 Negative Pulses @ 16 Hz rate approx. 15 Volts peak-to-peak
Pin 5 (Stop)	8 Positive Pulses @ 16 Hz rate approx. 15 Volts peak-to-peak
Pin 6 (Red Pwr)	No Signal
Pin 7 (Start)	8 Negative Pulses @ 16 Hz rate approx. 15 Volts peak-to-peak
<u>REDUCED POWER TEST</u>	
Pin 4 (Input)	4 Negative Pulses @ 16 Hz rate Approx. 15 Volts peak-to-peak
Pin 5 (Stop)	4 Negative Pulses @ 16 Hz rate Approx. 15 Volts peak-to-peak
Pin 6 (Red Pwr)	4 Negative Pulses @ 16 Hz rate Approx. 15 Volts peak-to-peak
Pin 7 (Start)	No Signal

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION	GROUP NUMBER AND QUANTITY				
			1	2	3	4	5
AR1	19A134379P001	LIN. OP-AMP RCA CA3130T	1	1			
AR2	19A116297P002	INT CKT. SC8273G1 BI	1	1			
AR3	19A116297P005	INT CKT LM248	1	1			
C1	19A116080P101	CAP 0.01 50VDC 10%	1	1			
C2	19A116080P107	CAP 0.1 50VDC 10%	1	1			
C3	19C300075P68001G	CAP 68KPF 2% 100VDC	1	1			
C4	19A134202P015	CAP 6.8UF 35V 20% TANT	1	1			
C5	19A116080P107	CAP 0.1 50VDC 10%	1	1			
C6	19A116080P107	CAP 0.1 50VDC 10%	1	1			
C7	19A116080P107	CAP 0.1 50VDC 10%	1	1			
C8	19C300075P68001G	CAP 68KPF 2% 100VDC	1	1			
C9	19A116080P107	CAP 0.1 50VDC 10%	1	1			
C10	19A134202P014	CAP 1 UF 35V 20% TANT	1	1			
C11	0246A9006P471	CAP 470PF 500V MICA	1	1			
C13	0246A9006P471	CAP 470PF 500V MICA	1	1			
C14	0246A9032P271	CAP 270 PFD MICA	1	1			
C15	0246A9032P271	CAP 270 PFD MICA	1	1			
C16	0246A9036P222	CAP .0022UF 50V 5% POLY	1	1			
C17	0246A9032P271	CAP 270 PFD MICA	1	1			
D17	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D17	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D18	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D18	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D19	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D19	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D20	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D20	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D21	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D21	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D22	0246A9416P022	LIGHT EMITTING DIODE RED	1				
D22	0246A9958P001	RED LED 12V LEDCO 4100-2		1			
D28	4037822P001	RECTIFIER - 1N4004G	1	1			
D29	4037822P001	RECTIFIER - 1N4004G	1	1			
Q1	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q2	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q3	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q4	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q5	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q6	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
Q7	19A115300P002	TSTR NPN 60V 2N3053	1	1			
Q8	19A116755P001	NPN TRANS 2N3947	1	1			
Q9	0246A9214P3251	2N3251 TRANSISTOR BI	1	1			
R1	0246A9134P3013	RES 301KOHM 1/4W 1% MTL	1	1			
R2	0246A9134P3013	RES 301KOHM 1/4W 1% MTL	1	1			
R3	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1			
R4	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R5	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R6	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R7	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R8	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R9	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R10	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R11	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R12	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R13	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R14	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R15	0246A9134P5492	RES 54.9K 1/4W 1%	1	1			
R16	0246A9134P1003	RES 100K OHM 1/4W 1% MTL	1	1			
R17	0246A9134P4022	RES 40.2KOHM 1/4W 1% MTL	1	1			
R18	0246A9134P1003	RES 100K OHM 1/4W 1% MTL	1	1			
R19	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1			
R20	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1			
R21	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R22	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R23	0246A9105P104	RES 100K OHM 1/4W 5% CRN	1	1			
R24	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R25	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R26	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R27	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1			
R28	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1	1			

Figure 1 (19D428721 G1 [4], G2 [3]) Remote Checkback Parts List

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION	GROUP NUMBER AND QUANTITY					
			1	2	3	4	5	
R28	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R29	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1					
R29	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R30	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R31	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R32	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1					
R32	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R33	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R34	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R35	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1					
R35	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R36	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R37	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R38	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1					
R38	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R39	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R40	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R41	0246A9134P1911	RES 1.91KOHM 1/4W 1% MTL	1					
R41	0246A9134P7320	RES 732 OHM 1/4W 1% MTL		1				
R42	0246A9106P75R0	RESISTOR	1	1				
R43	0246A9106P75R0	RESISTOR	1	1				
R44	0246A9105P104	RES 100K OHM 1/4W 5% CRN	1	1				
R45	0246A9134P5111	RES 5.11KOHM 1/4W 1% MTL	1	1				
R46	0246A9105P103	RES 10K OHM 1/4W 5% CRN	1	1				
R47	0246A9134P1501	RES 1.5K OHM 1/4W 1% MTL	1	1				
R48	0246A9134P1001	RES 1K OHM 1/4W 1% MTL	1	1				
R49	0246A9134P1473	RES 147K OHM 1/4W 1% MTL	1	1				
R50	0246A9134P1473	RES 147K OHM 1/4W 1% MTL	1	1				
R51	0246A9134P2943	RES 294K OHM 1/4W 1% MTL	1	1				
R52	0246A9134P1003	RES 100K OHM 1/4W 1% MTL	1	1				
R53	0246A9134P1743	RES 174K OHM 1/4W 1% MTL	1	1				
R54	0246A9134P2370	RES 237 OHM 1/4W 1%	1	1				
R55	0246A9134P1001	RES 1K OHM 1/4W 1% MTL	1	1				
R56	0246A9134P1001	RES 1K OHM 1/4W 1% MTL	1	1				
R57	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1				
R58	0246A9134P1503	RES 150K OHM 1/4W 1% MTL	1	1				
R59	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1				
R60	0246A9134P5112	RES 51.1KOHM 1/4W 1% MTL	1	1				
R61	0246A9134P5901	RES 5.9K OHM 1/4W 1% MTL	1	1				
R62	0246A9134P1001	RES 1K OHM 1/4W 1% MTL	1	1				
R63	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1				
R64	0246A9134P1002	RES 10K OHM 1/4W 1% MTL	1	1				
S1	7481654P006	SW. PUSH. SPNO. RED	1	1				
S2	7481654P006	SW. PUSH. SPNO. RED	1	1				
U1	0246A9502P4040	I. C. 4040 CMOS	1	1				
U2	0246A9502P4040	I. C. 4040 CMOS	1	1				
U3	0246A9502P4001	I. C. 4001 CMOS	1	1				
U4	0246A9502P4013	I. C. 4013 CMOS	1	1				
U5	0246A9502P4013	I. C. 4013 CMOS	1	1				
U6	0246A9502P4011	I. C. 4011 CMOS	1	1				
U7	0246A9502P4017	I. C. 4017 CMOS	1	1				
U8	0246A9502P4017	I. C. 4017 CMOS	1	1				
U11	0246A9502P4017	I. C. 4017 CMOS	1	1				
U12	0246A9502P4013	I. C. 4013 CMOS	1	1				
U13	0246A9502P4040	I. C. 4040 CMOS	1	1				
U14	0246A9502P4040	I. C. 4040 CMOS	1	1				
U15	0246A9502P4011	I. C. 4011 CMOS	1	1				
U16	0246A9502P4013	I. C. 4013 CMOS	1	1				
U17	0246A9502P4011	I. C. 4011 CMOS	1	1				
U18	0246A9502P4013	I. C. 4013 CMOS	1	1				
U19	0246A9502P4011	I. C. 4011 CMOS	1	1				
U20	0246A9502P4013	I. C. 4013 CMOS	1	1				
VR1	0246A9403P6R2	ZENER 6.2V 5% 400MW	1	1				
VR2	0246A9403P6R2	ZENER 6.2V 5% 400MW	1	1				
W1	0246A9141P001	JUMPER .00 OHM RES	1	1				
W2	0246A9141P001	JUMPER .00 OHM RES	1	1				
Y1	19A701383P001	XTAL 32.768 KHZ	1	1				

Figure 1 (19D428721 G1 [4]. G2 [3]) Remote Checkback Parts List, continued



SECTION A-A

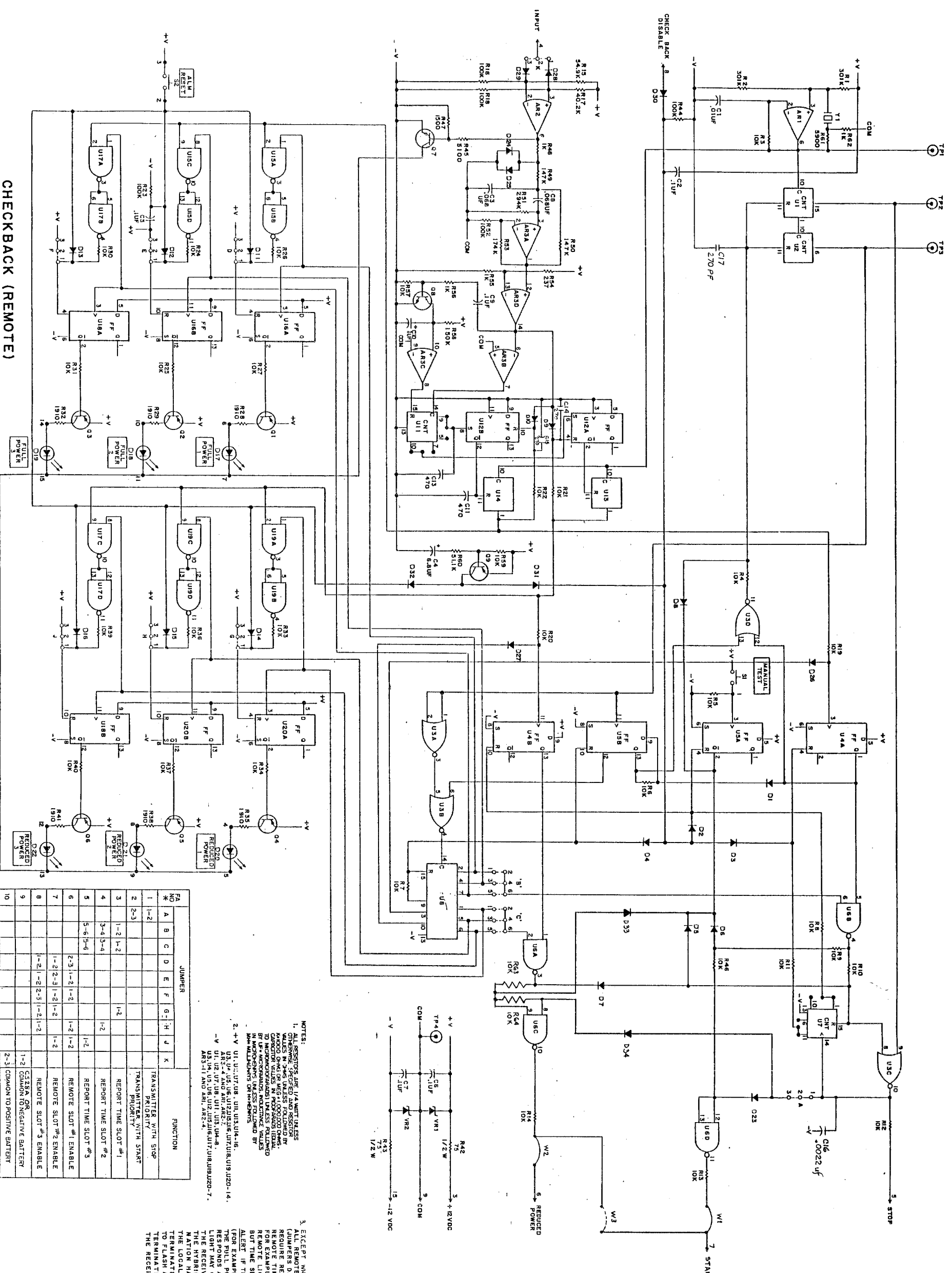
CONNECTION CHART FOR D17 THRU D22, S1 & S2

FROM	TO
D17 R	6
D18 R	7
D19 R	10
D20 R	14
D21 R	15
D22 R	16
S1-1	17
S1-2	18
S2-1	19
S2-2	20
	S1-2

FIGURE 2
PIB-RP4

- (14) NOTES:
1. SOLDER ALL ELECTRICAL CONNECTIONS.
 2. COMPONENT LEADS TO PROTRUDE .09 MAX.
 3. BELDY SOLDER SIDE OF BOARD.
 4. MARK GROUP NUMBER AND REV. LTR. PER 19411574DPI.1.125 HIGH. (SEE REV. LTR. INDEX A7141044).
 5. TO BE 125 MIN ABOVE BOARD.
 6. THE FOLLOWING COMPONENTS MAY BE ADVERSELY AFFECTED BY FREON CLEANING: S1 & S2
 7. THE FOLLOWING ITEMS ARE MOS DEVICES REQUIRING SPECIAL CARE PER A4029229 UI-07 AND UI0-U20.

Figure 2 (19D428721 Sh 2 [1]) Remote Checkback Outline



NOTES:

1. ALL RESISTORS ARE 1/4 WATT UNLESS SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY A PREFIX OR SUFFIX. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE TO BE MICROHMIC UNLESS INDICATED BY A PREFIX OR SUFFIX. ALL CAPACITORS ARE TO BE ELECTROLYTIC UNLESS OTHERWISE SPECIFIED BY A PREFIX OR SUFFIX.
2. +V U1, U2, U7, U8, U9, U13, U14, U15, U16, U17, U18, U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, U53, U54, U55, U56, U57, U58, U59, U60, U61, U62, U63, U64, U65, U66, U67, U68, U69, U70, U71, U72, U73, U74, U75, U76, U77, U78, U79, U80, U81, U82, U83, U84, U85, U86, U87, U88, U89, U90, U91, U92, U93, U94, U95, U96, U97, U98, U99, U100.

FA NO	A	B	C	D	E	F	G	H	J	K	FUNCTION
1	1-2										TRANSMITTER WITH STOP PRIORITY
2	2-3										TRANSMITTER WITH START PRIORITY
3	1-2	1-2									REPORT TIME SLOT #1
4	3-4	3-4									REPORT TIME SLOT #2
5	5-6	5-6									REPORT TIME SLOT #3
6	2-3	1-2	1-2								REMOTE SLOT #1 ENABLE
7	1-2	2-3	1-2								REMOTE SLOT #2 ENABLE
8	1-2	1-2	2-3	1-2							REMOTE SLOT #3 ENABLE
9											C528A OR COMMON TO POSITIVE BATTERY
10											C528A OR COMMON TO POSITIVE BATTERY

CHECKBACK (REMOTE)
 19D428721G1 REV.
 19D428721G2 REV.

* Revised since last issue

*Figure 3 (19D435387 [6])
 Remote Checkback Schematic

AUXILIARY RELAY 19D427620G3

DESCRIPTION

The Auxiliary Relay, 19D427620G3, is used in conjunction with the CB10A Checkback Equipment. It provides isolation between the Checkback shelf and the associated PLC equipment through use of three mercury-wetted relays. These relays have separate inputs and outputs. Three LED indicators show which relay is energized.

OPERATION

Refer to the Schematic Diagram located in this instruction. A positive input signal applied to the INPUT of relay #1 or to INPUT #1 of relay #2 will switch the associated input amplifier ON. This switches on the relay driver Q1 or Q2, energizing K1 or K2. A positive input to INPUT #2 of relay #2 will override an INPUT #1 of relay #2 and lock the relay #2 input amplifier in the OFF position.

Relay K3 is energized directly by application of 125 VDC (Jumper "A" in the 1-2 position) or 48 VDC (Jumper "A" in the 2-3 position) to relay #3 INPUT #1 (+) and INPUT #2 (-). An external resistor is used for 250 VDC applications.

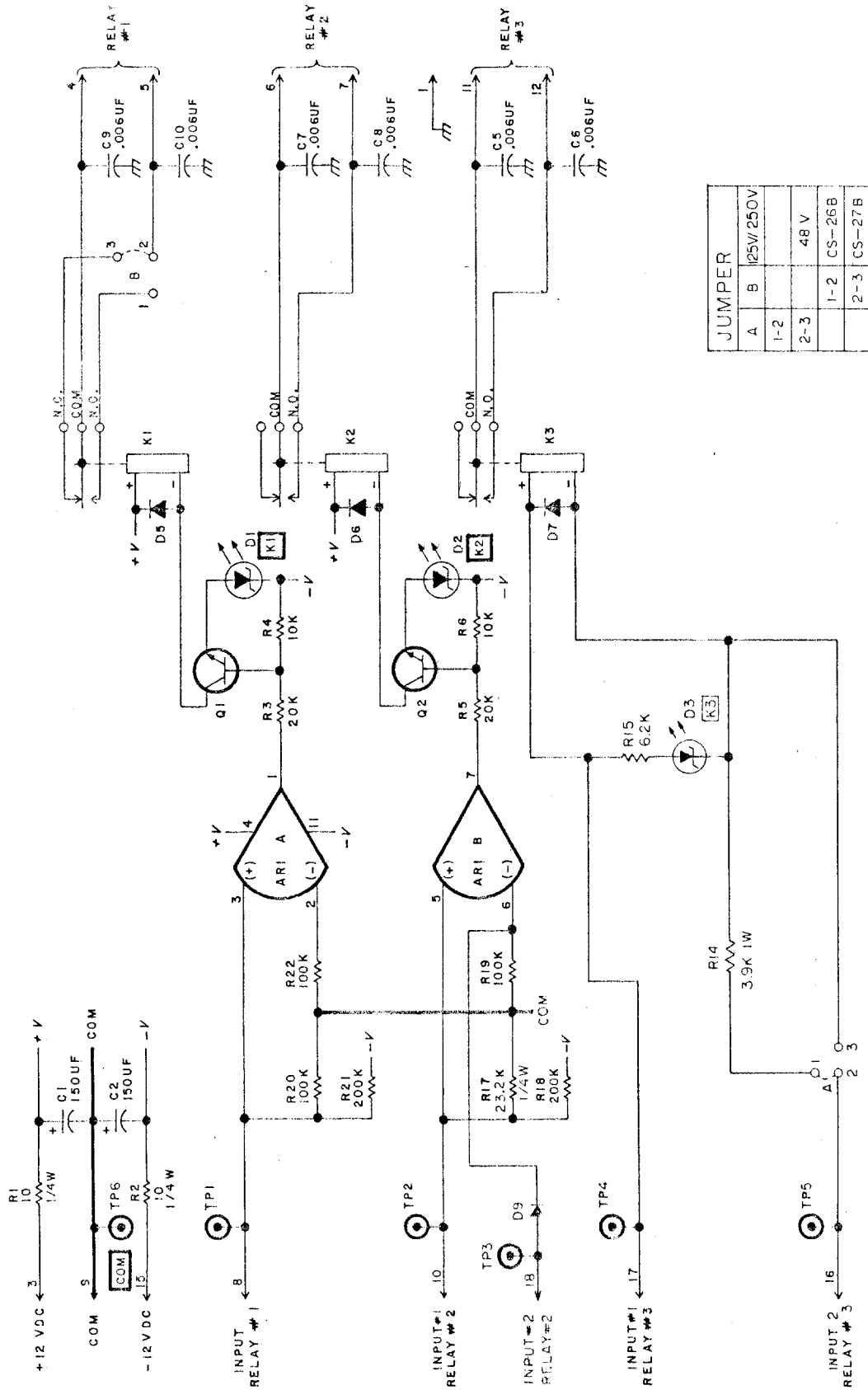
NOMINAL OPERATING CHARACTERISTICS

1. Input level

a.	Relay #1 INPUT,	Relay #2 INPUT #1,	+ 10 VDC = ON
b.		Relay #2 INPUT #2,	+ 10 VDC = OFF
c.	Relay #3	Jumper "A" 1-2	125 VDC
		Jumper "A" 2-3	48 VDC
2. Output contacts: 100 VA
3. Relay operate time: 2 milliseconds max.

ITEM NO.	IDENTIFICATION NUMBER	DESCRIPTION			
			1	2	3
	19D427620G003 REV#02	CHK-BACK AUX.			
AR1	0246A9351P224	OP. AMP. LM224			1
C1	5496267P012	CAPACITOR			1
C2	5496267P012	CAPACITOR			1
C5	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
C6	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
C7	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
C8	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
C9	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
C10	0246A9028P682	CAP 6800PF CERAMIC RV#1			1
D1	0246A9418P406	LED, RED			1
D2	0246A9418P406	LED, RED			1
D3	0246A9418P406	LED, RED			1
D5	0246A9401P4148	DIODE JAN 1N4148			1
D6	0246A9401P4148	DIODE JAN 1N4148			1
D7	4037822P001	RECTIFIER - 1N4004G			1
D9	0246A9401P4148	DIODE JAN 1N4148			1
K1	19B209439P001	REL			1
K2	19B209439P001	REL			1
K3	19B209439P001	REL			1
Q1	19A115300P002	TSTR NPN 60V 2N3053			1
Q2	19A115300P002	TSTR NPN 60V 2N3053			1
R1	0246A9134P10R0	RES 10 OHM 1/4W 1% MTL			1
R2	0246A9134P10R0	RES 10 OHM 1/4W 1% MTL			1
R3	0246A9102P203	RES 20K .5W 5%			1
R4	0246A9102P103	RES 10KOHM .5W 5%			1
R5	0246A9102P203	RES 20K .5W 5%			1
R6	0246A9102P103	RES 10KOHM .5W 5%			1
R14	19A116479P2392K	RES 3.9KOHM 10% 2W FLPRF			1
R15	0246A9103P622	RES 6.2K 1W 5%			1
R17	0246A9134P2322	RES 23.2KOHM 1/4W 1% MTL			1
R18	0246A9102P204	RESISTOR			1
R19	0246A9102P104	RES 100K .5W 5%			1
R20	0246A9102P104	RES 100K .5W 5%			1
R21	0246A9102P204	RESISTOR			1
R22	0246A9102P104	RES 100K .5W 5%			1

AUXILIARY RELAY-PARTS LIST - 19D427620G3

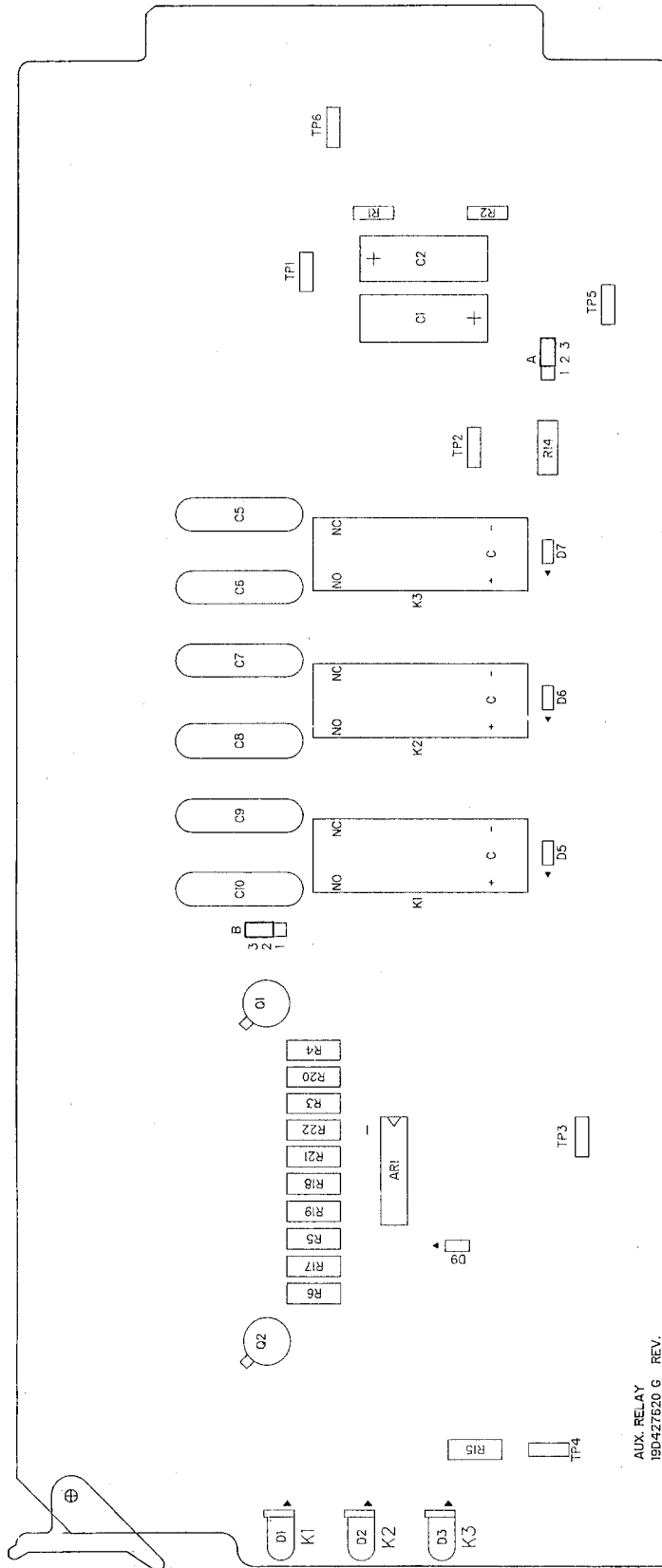


AUX RELAY
19D427620 G3, G103

NOTES:

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EXCEPT MICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS, INDUCTANCE VALUES IN MICRO-HENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

SCHEMATIC DIAGRAM-19C335562 [2]



AUX. RELAY
19D427620 G REV.

AUXILIARY RELAY OUTLINE - 19D427620 SH.3 [1]