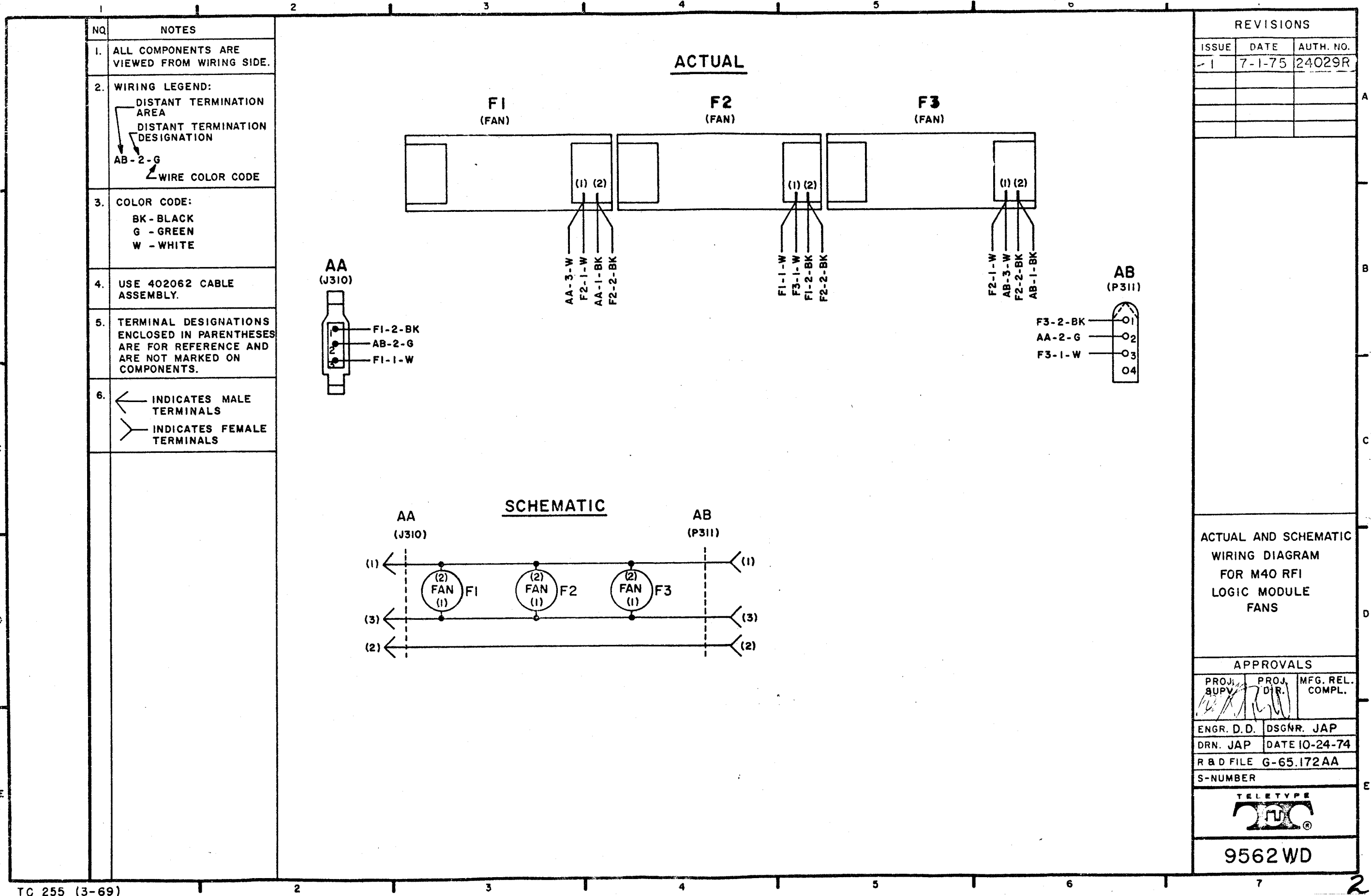
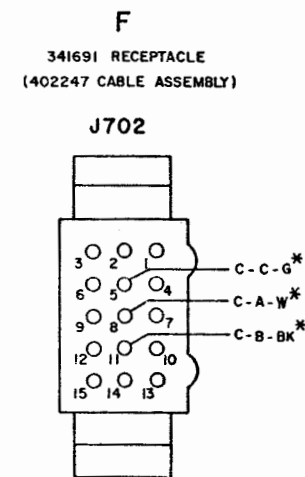
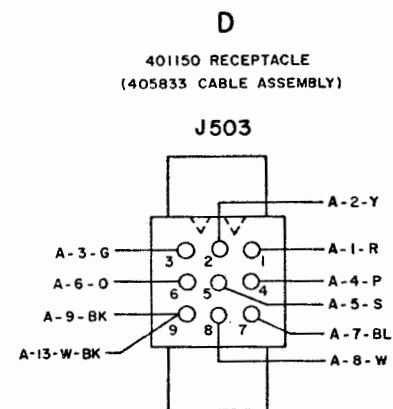
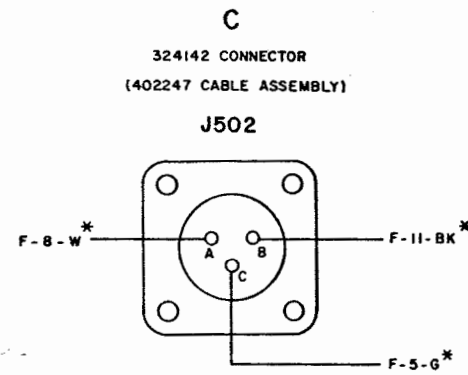
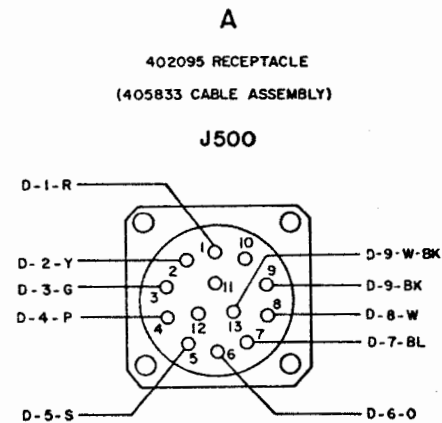




NO.	NOTES										
1.	WIRING LEGEND: — DISTANT TERMINATING AREA. — DISTANT TERMINATING DESIGNATION. A-I-W — WIRE COLOR CODE										
2.	COLOR CODE: <table> <tr> <td>BK - BLACK</td> <td>BL - BLUE</td> </tr> <tr> <td>BR - BROWN</td> <td>R - RED</td> </tr> <tr> <td>W - WHITE</td> <td>S - SLATE</td> </tr> <tr> <td>P - PURPLE</td> <td>O - ORANGE</td> </tr> <tr> <td>G - GREEN</td> <td>Y - YELLOW</td> </tr> </table>	BK - BLACK	BL - BLUE	BR - BROWN	R - RED	W - WHITE	S - SLATE	P - PURPLE	O - ORANGE	G - GREEN	Y - YELLOW
BK - BLACK	BL - BLUE										
BR - BROWN	R - RED										
W - WHITE	S - SLATE										
P - PURPLE	O - ORANGE										
G - GREEN	Y - YELLOW										
3.	* - INDICATES 18 GAUGE WIRE ALL OTHER WIRE 24 OR 26 GAUGE.										



REVISIONS		
ISSUE	DATE	AUTH. NO.
1	1-5-76	24038-R
2	8-31-76	15536

ACTUAL WIRING
DIAGRAM
FOR
40 CAB 252 RA

APPROVALS		
PROJ. SUBV.	PROJ. DIR.	MFG. REL. COMPL.
ENGR. DCL.	DSGNER. EMR	
DRN. JAP	DATE 3-26-75	
R&D FILE G-65.172AA		
S-NUMBER		



9572WD

REVISIONS		
ISSUE	DATE	AUTH. NO.
1	7-1-75	23970-R
2	9-12-75	14552
3	10-15-76	14660
4	11-13-78	20809

ACTUAL
WIRING DIAGRAM
FOR 40PSUI02
& 40PSUI03
POWER SUPPLIES

APPROVALS		
PROJ. SUPV.	PROJ. DIR.	MFG. REL. COMPL.
ENGR. M.H.	DSGMR. R.H.	
DRN. A.H.	DATE 2-17-75	
R&D FILE	1.33.172 AA	
S-NUMBER	62131	



9581WD

NOTES

1. WIRE LEGEND:

BA - 4 - W
WIRE COLOR CODE.
DISTANT TERMINATING
DESIGNATION.
DISTANT TERMINATING
AREA.

2. COLOR CODE:

BK - BLACK
BR - BROWN
R - RED
O - ORANGE
Y - YELLOW
G - GREEN
W - WHITE
V - VIOLET
S - SLATE
W-G - WHITE-GREEN

3. TERMINAL DESIGNATIONS ENCLOSED IN PARENTHESIS ARE FOR REFERENCE AND ARE NOT MARKED ON COMPONENT.

4. CONNECTOR VIEWED FROM PIN SIDE.

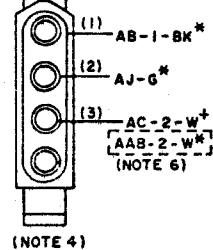
5. WIRE GAGE:

ALL WIRES 14 AWG. UNLESS NOTED.
* - 18 AWG.
+ - 16 AWG.
Δ - 12 AWG.

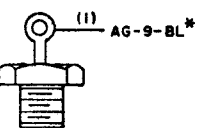
6. WIRING INDICATED BY [] APPLIES TO 40PSUI03 ONLY. ALTERNATE WIRING APPLIES TO 40PSUI02.

7. PUSH ON-PULL OFF CIRCUIT BREAKER (403700) REPLACED BY TOGGLE CIRCUIT BREAKER (403728) FOR U/L RECOGNITION AND CSA CERTIFICATION.

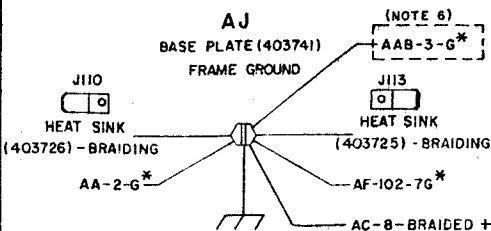
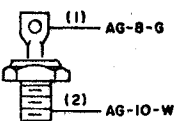
AA
(J101)
CONNECTOR



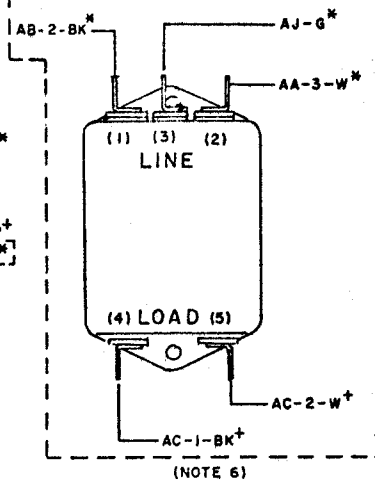
AE
(TS-1)
TEMPERATURE SENSOR



AK
(CR1)
DIODE

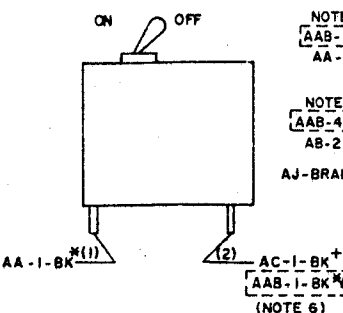


AAB
LINE FILTER

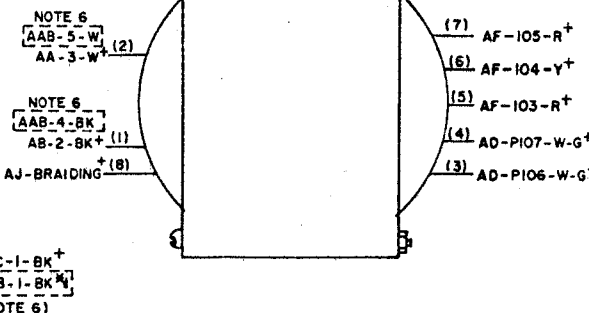


AB
(CB-1)
CIRCUIT BREAKER
403728

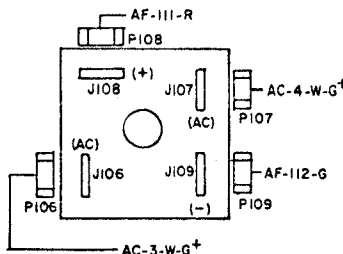
(NOTE 7)



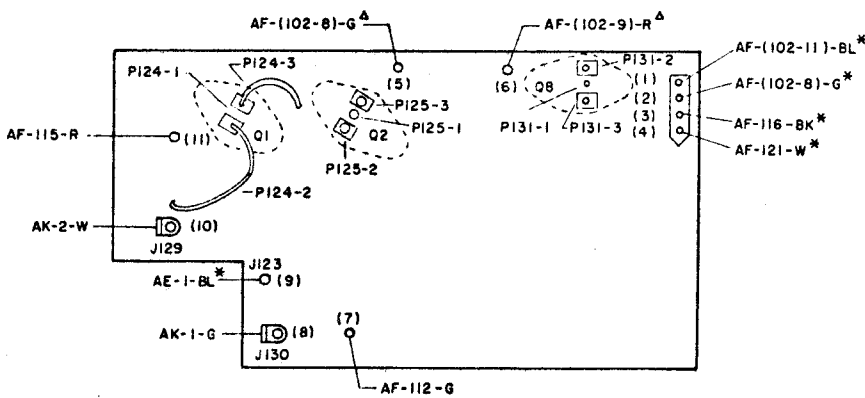
AC
(T1)
TRANSFORMER



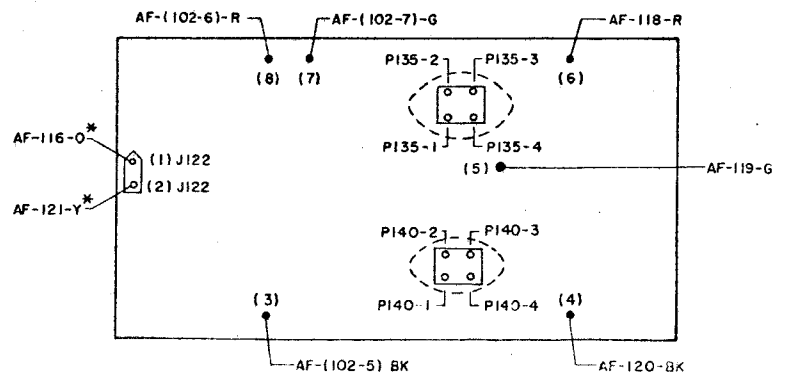
AD
(CR101)
RECTIFIER, BRIDGE



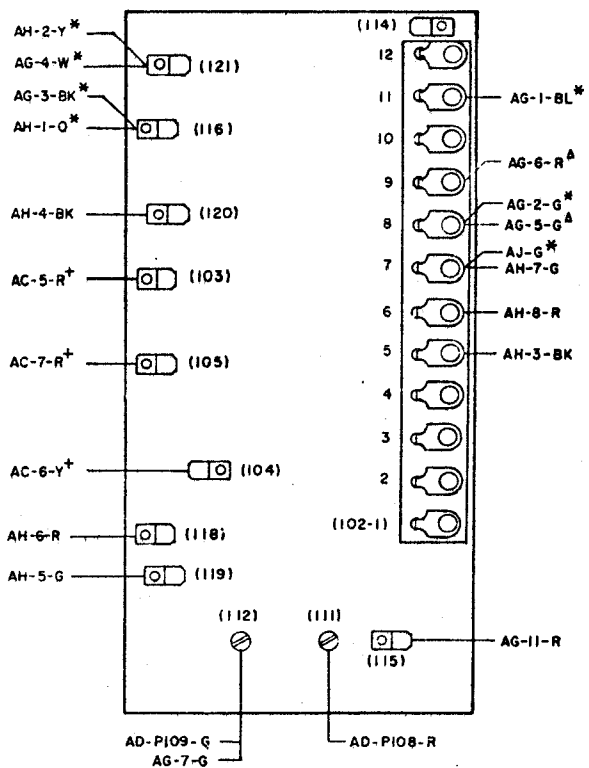
AG
CARD, +5 REGULATOR
410012



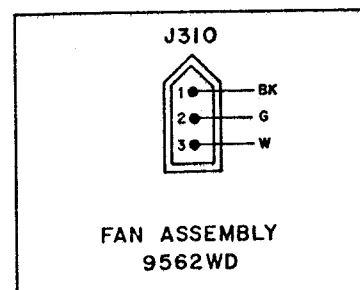
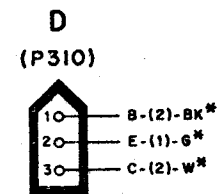
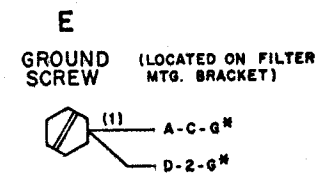
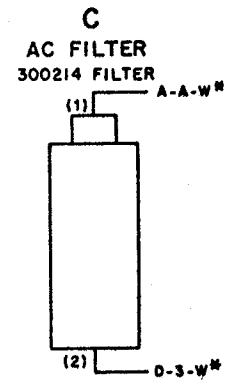
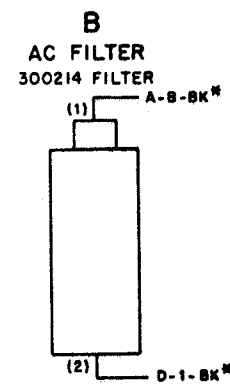
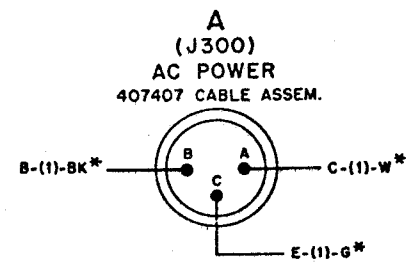
AH
CARD, ±12V REGULATOR
410011



AF
CARD, AC TO DC
410010



AC CIRCUITS



410203 CIRCUIT CARD
POWER CONNECTIONS
AND I/O CONNECTORS
(1657SD)

SEE SHEET 5 FOR
CABLE CONNECTIONS

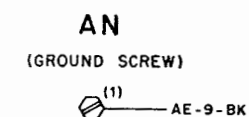
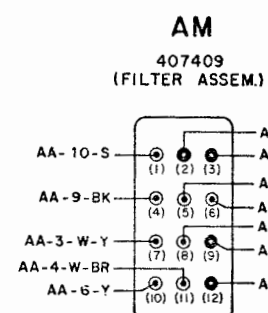
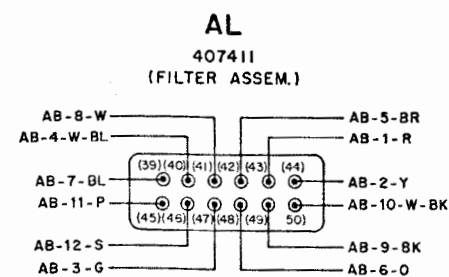
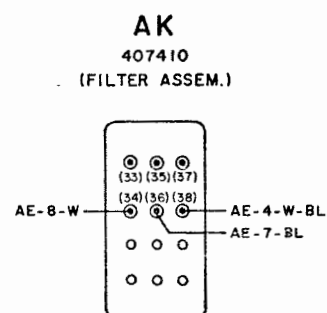
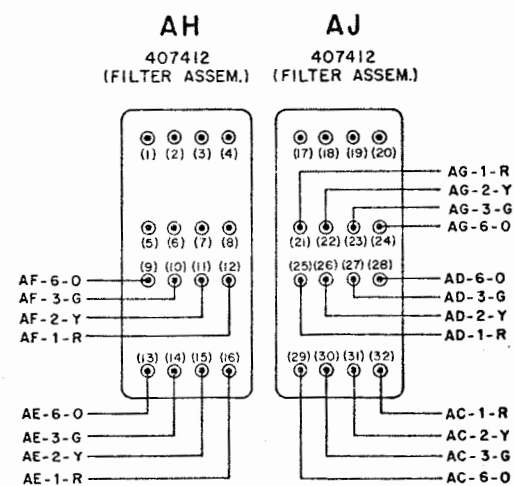
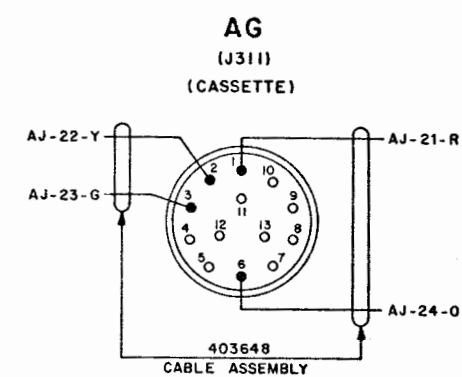
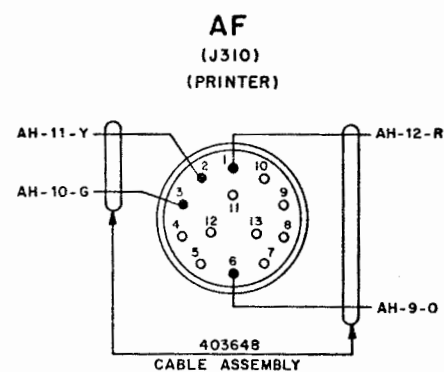
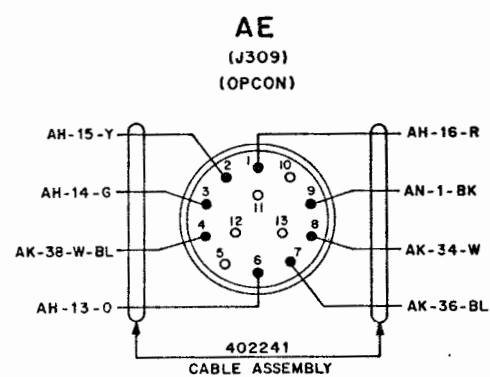
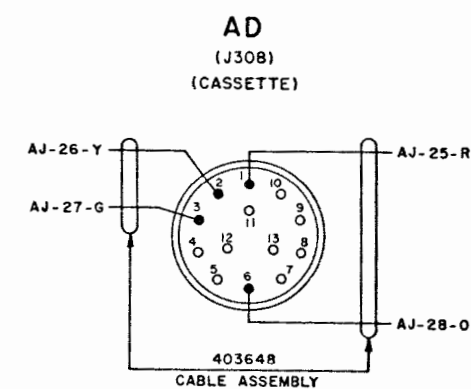
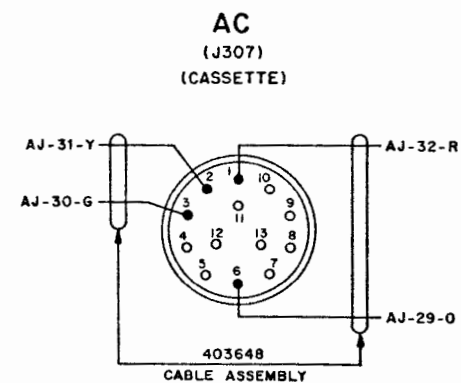
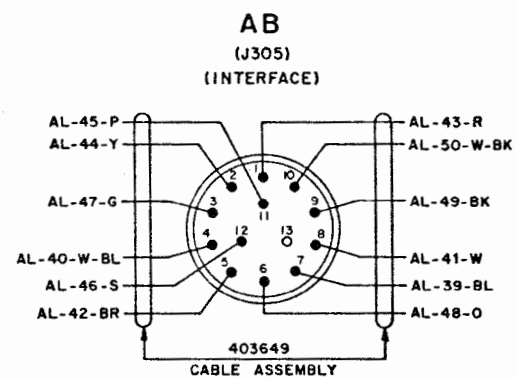
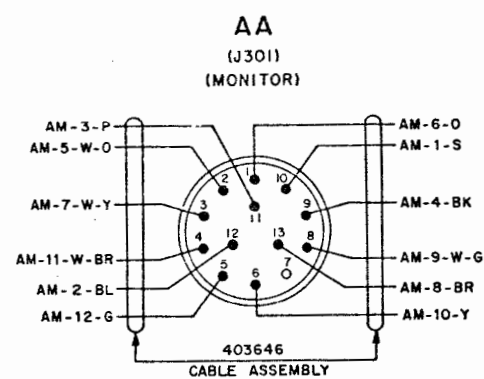
ACTUAL WIRING DIAGRAM
FOR
40C435/ZZZ/C/O
CONTROLLER
W/O CARDS



9617WD-2

FEED THROUGH PANELS

ISSUE
1

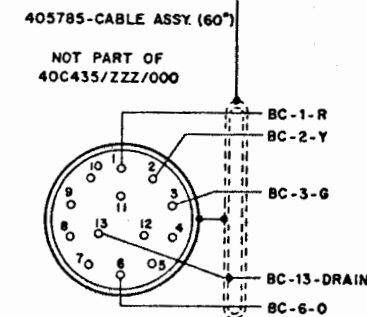
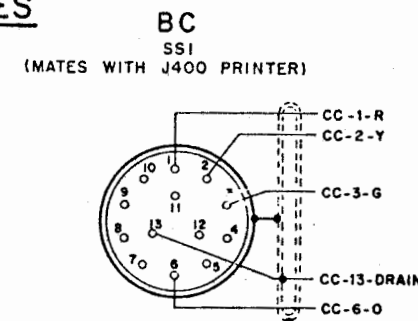
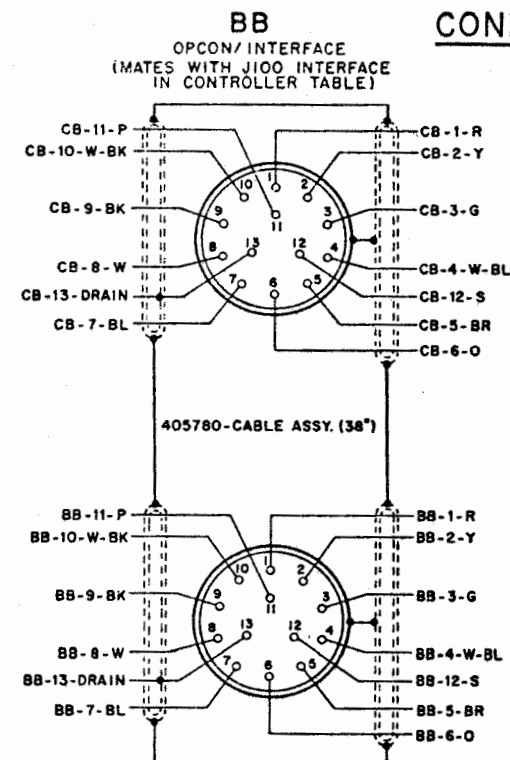
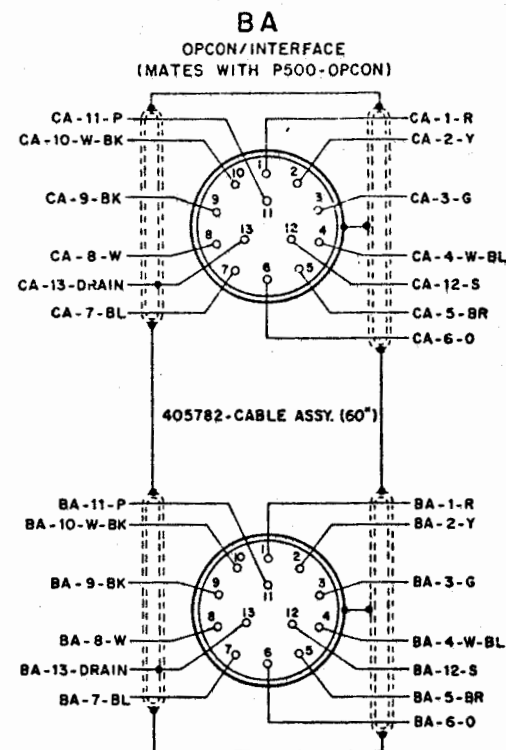


ACTUAL WIRING DIAGRAM
FOR
40C435/ZZZ/000
CONTROLLER
W/O CARDS

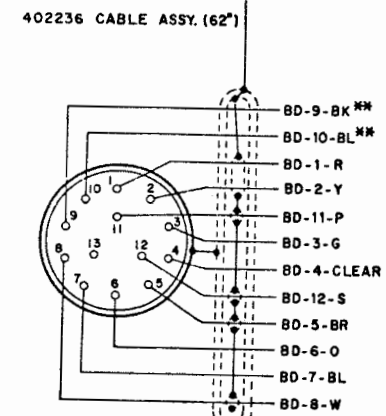
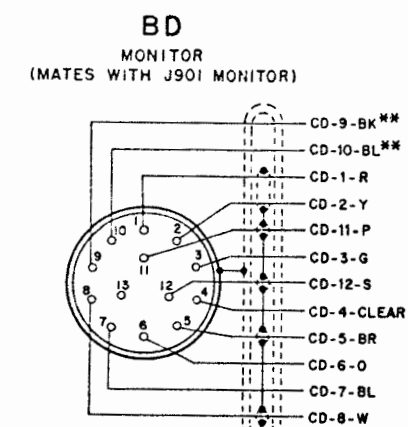
TELETYPE
9617WD-3

CONNECTING CABLES

ISSUE
1

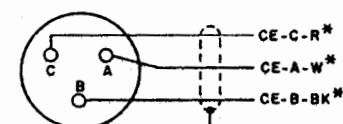


CC
SSI
(MATES WITH J310)

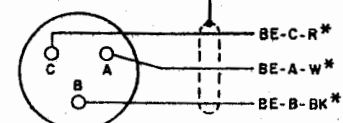


CD
MONITOR
(MATES WITH J301)

BE
AC POWER
(MATES WITH J200 INTERFACE)

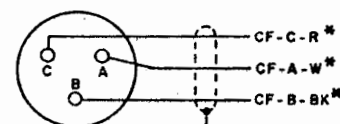


405710-AC POWER
CABLE ASSY. (24")



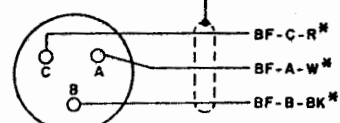
CE
AC POWER
(MATES WITH J300 POWER)

BF
AC POWER
(MATES WITH J201 INTERFACE)



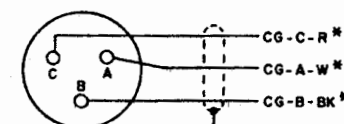
405711-AC POWER
CABLE ASSY. (45")

NOT PART OF
40C435/ZZZ/000



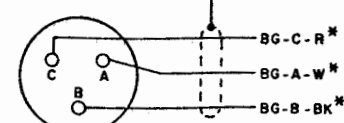
CF
AC POWER
(MATES WITH J402 POWER)

BG
AC POWER
(MATES WITH J202 INTERFACE)



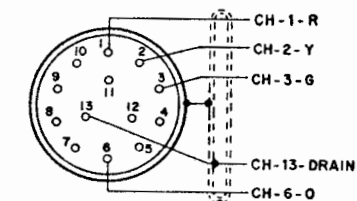
405712-AC POWER
CABLE ASSY. (32")

NOT PART OF
40C435/ZZZ/000

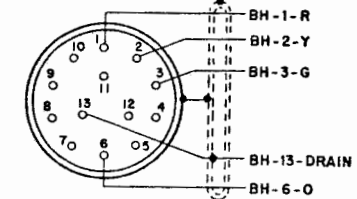


CG
AC POWER
(MATES WITH J502 POWER)

BH
SSI
(MATES WITH J601 CASSETTE)



405785-CABLE ASSY. (60")
(3 REQ'D.)
NOT PART OF
40C435/ZZZ/000



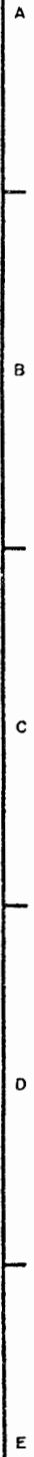
CH
SSI
(MATES WITH J307,
J308 & J311)

ACTUAL WIRING DIAGRAM
FOR
40C435/ZZZ/000
CONTROLLER
W/O CARDS



9617WD-4

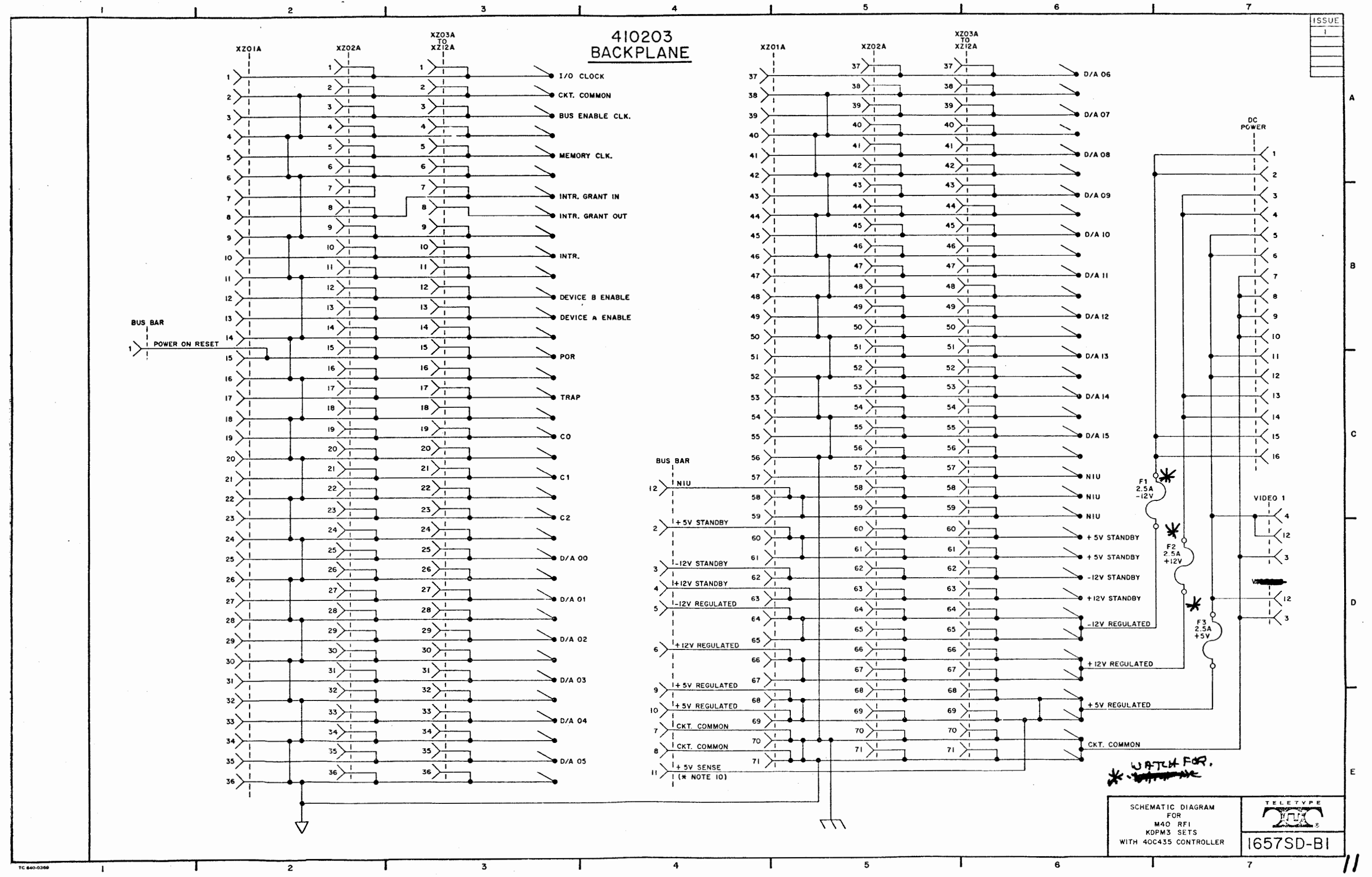
1. C_1, C_2, C_3



TELETYPE

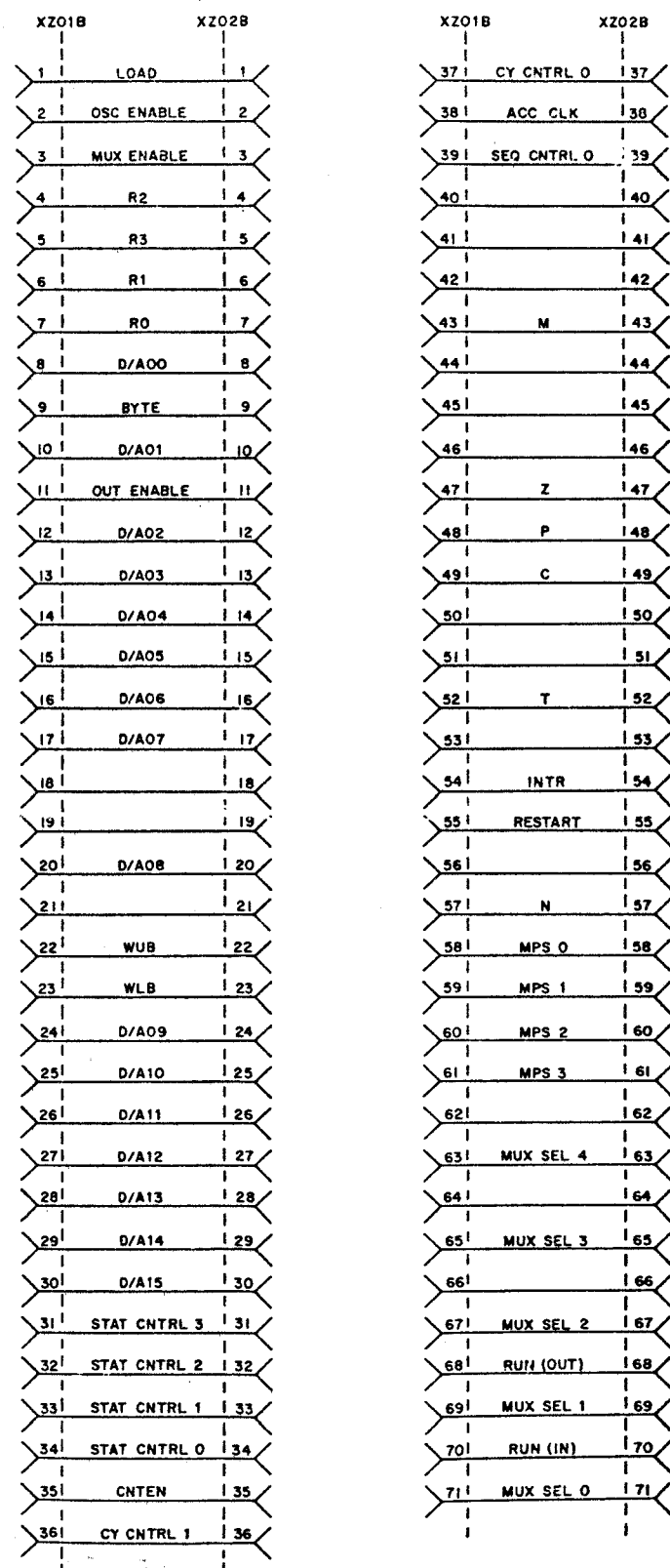
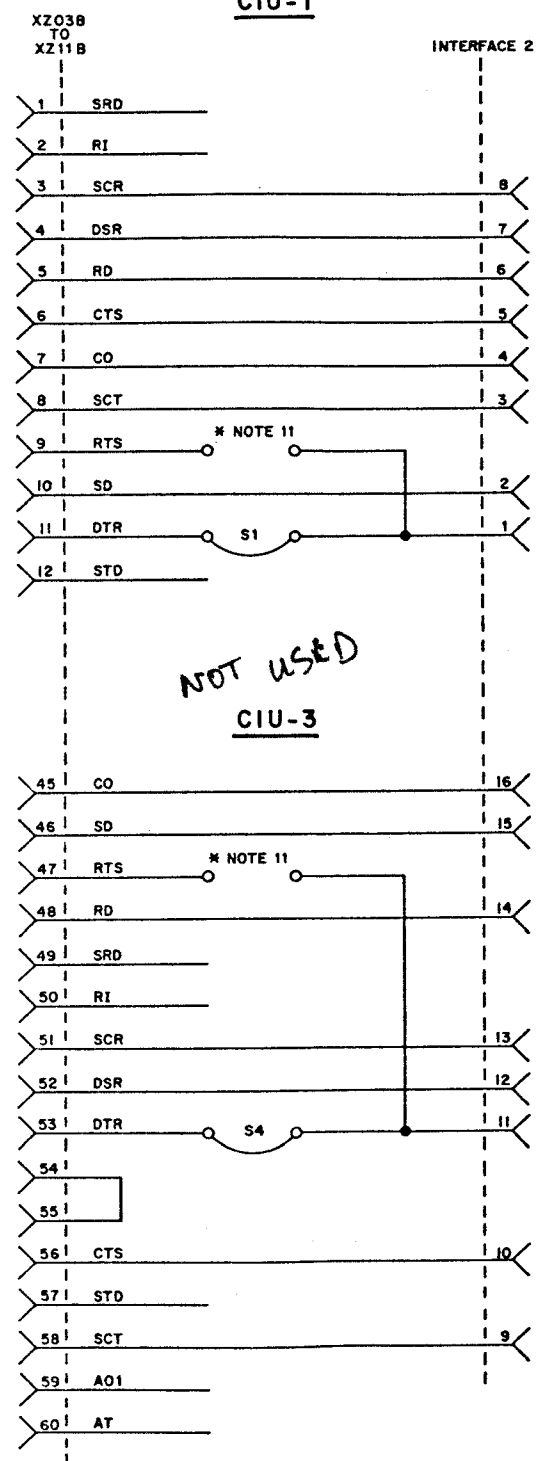

9

MOTHER BOARD

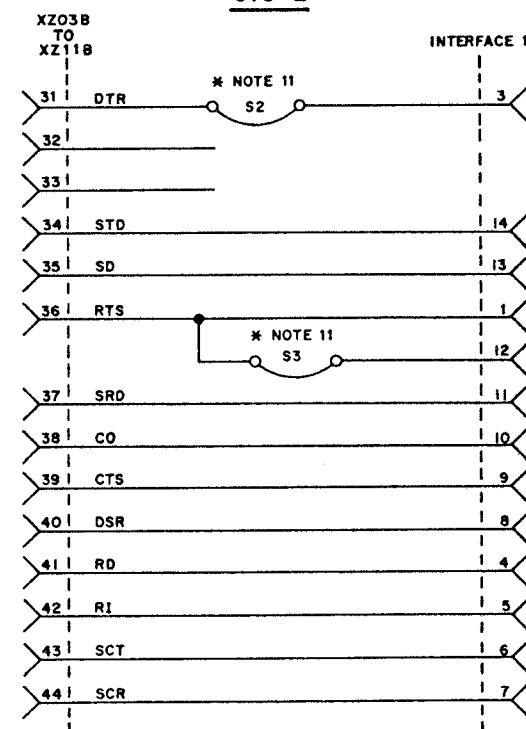


ISSUE
1

IXL BUSING

410203
BACKPLANENOT USED
CIU-1

CIU-2

SCHEMATIC DIAGRAM
FOR
M40 RFI
KDPM3 SETS
WITH 40C435 CONTROLLER

1657-SD-B2

410203 BACKPLANE

XZ03B
XZ05B
XZ07B
XZ09B
AND
XZ11B

DISPLAY I/O		VIDEO 1
64	HALF INTENSITY	10
65	HALF INTENSITY	5
66	VIDEO	9
67	VIDEO	6
68	HORIZONTAL	1
69	HORIZONTAL RETURN	14
70	VERTICAL	13
71	VERTICAL RETURN	2

XZ03B
XZ05B
AND
XZ07B

SSI		SSI "A"
13	ITD4	1
14	ITD4	2
15	ITC4	3
16	ITC4	4
17	ITD3	16
18	ITD3	15
19	ITC3	14
20	ITC3	13
21	ITD2	12
22	ITD2	11
23	ITC2	10
24	ITC2	9
25	ITD1	5
26	ITD1	6
27	ITC1	7
28	ITC1	8

XZ04B
XZ06B
XZ08B
AND
XZ10B

DISPLAY I/O ~~NOT USED~~		VIDEO 2
64	HALF INTENSITY	10
65	HALF INTENSITY	5
66	VIDEO	9
67	VIDEO	6
68	HORIZONTAL	1
69	HORIZONTAL RETURN	14
70	VERTICAL	13
71	VERTICAL RETURN	2

XZ04B
XZ06B
XZ08B
AND
XZ10B

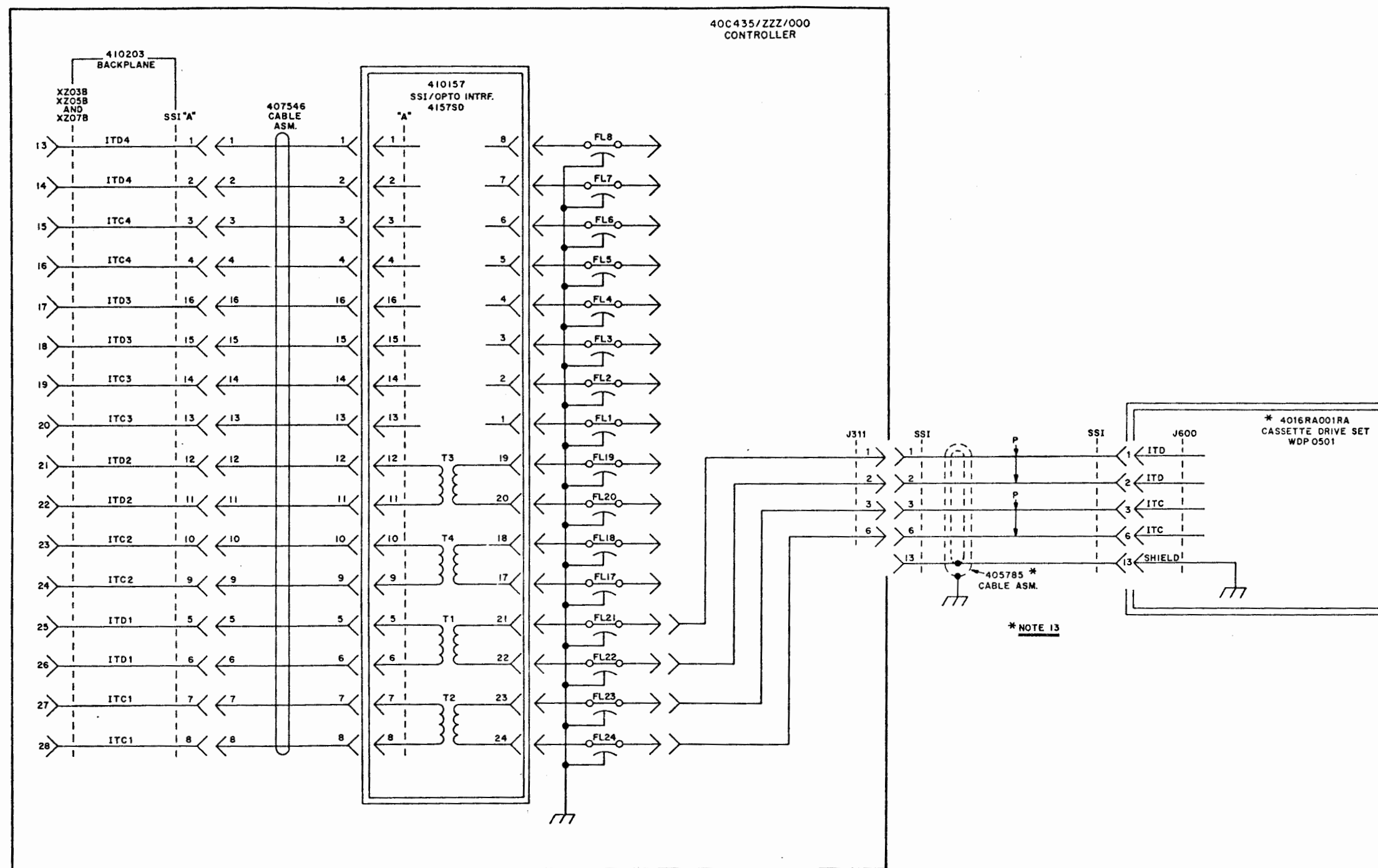
SSI		SSI "B"
13	ITD4	1
14	ITD4	2
15	ITC4	3
16	ITC4	4
17	ITD3	16
18	ITD3	15
19	ITC3	14
20	ITC3	13
21	ITD2	12
22	ITD2	11
23	ITC2	10
24	ITC2	9
25	ITD1	5
26	ITD1	6
27	ITC1	7
28	ITC1	8

XZ09B
AND
XZ11B

SSI		SSI "C" * NOTE 12
13	ITD4	1
14	ITD4	2
15	ITC4	3
16	ITC4	4
17	ITD3	16
18	ITD3	15
19	ITC3	14
20	ITC3	13
21	ITD2	12
22	ITD2	11
23	ITC2	10
24	ITC2	9
25	ITD1	5
26	ITD1	6
27	ITC1	7
28	ITC1	8

R/T TAPE CASSETTE SSI INTERFACE

ISSUE
1



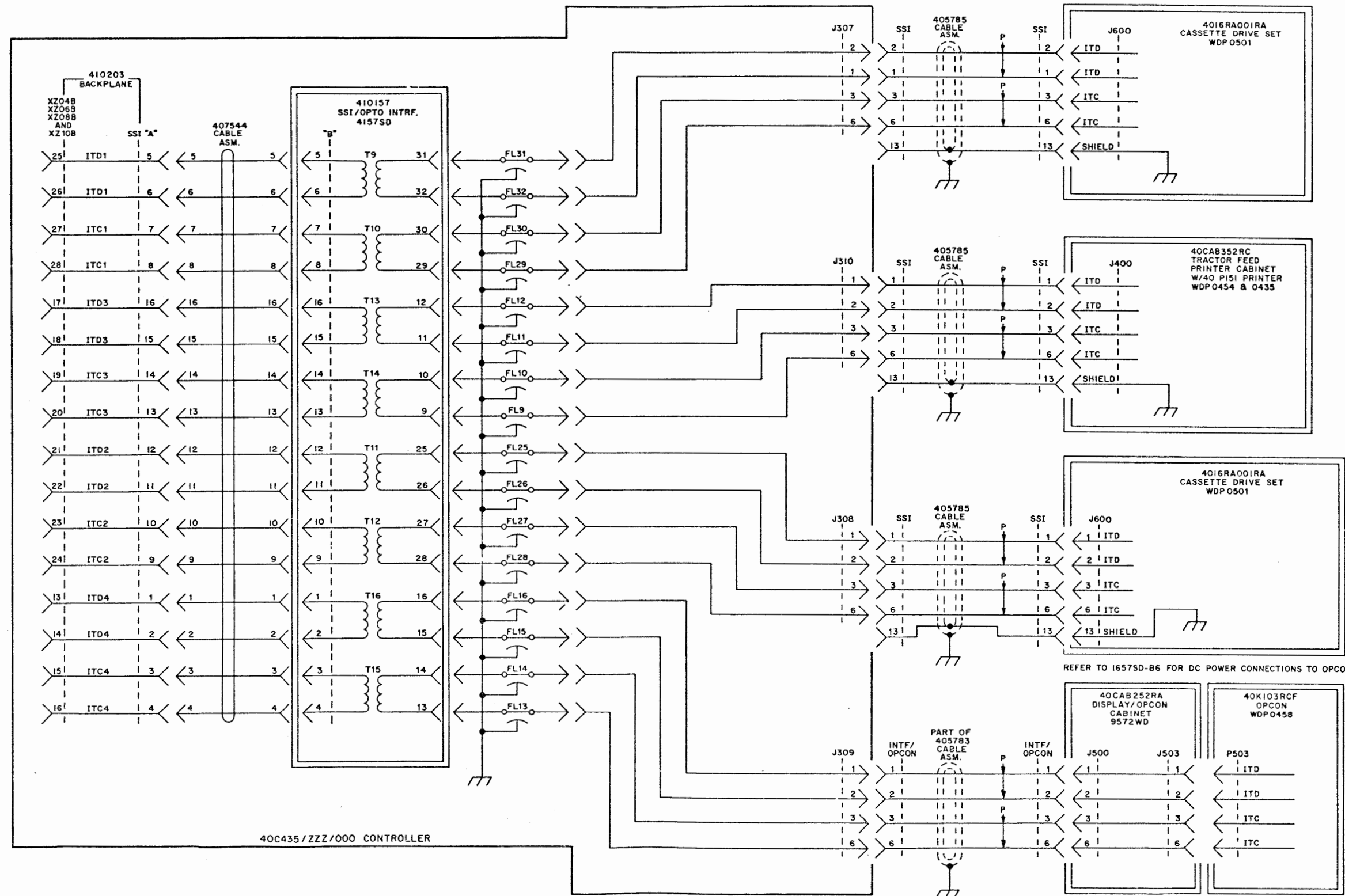
SCHEMATIC DIAGRAM
FOR
M40 RFI
KDPM3 SETS
WITH 40C435 CONTROLLER



1657SD-B4

R/T TAPE CASSETTE/PRINTER/OPCON SSI INTERFACE

ISSUE
1



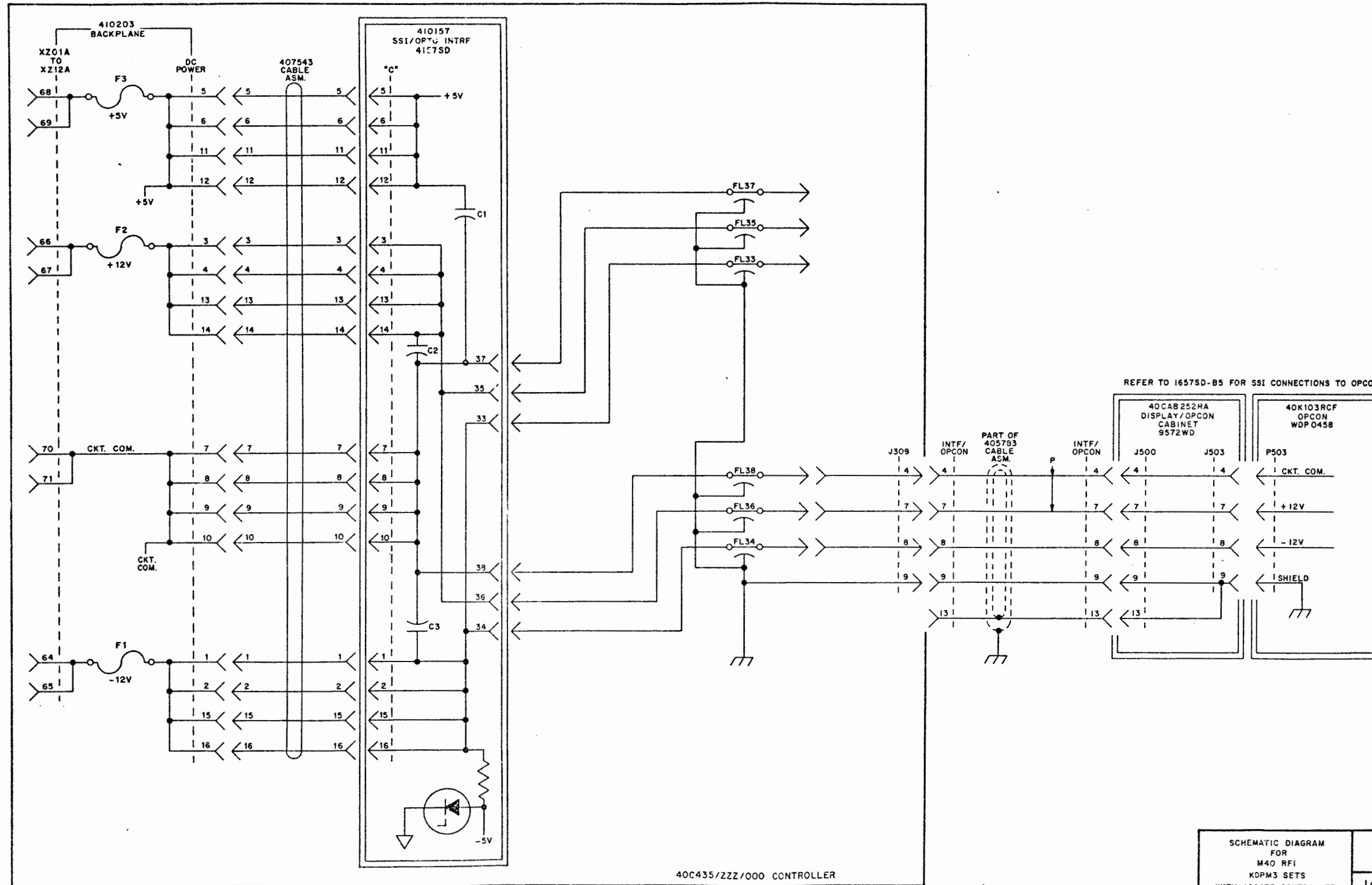
SCHEMATIC DIAGRAM
FOR
M40 RFI
KOPM3 SETS
WITH 40C435 CONTROLLER



I657SD-B5

OPCON SSI INTERFACE

ISSUE
1



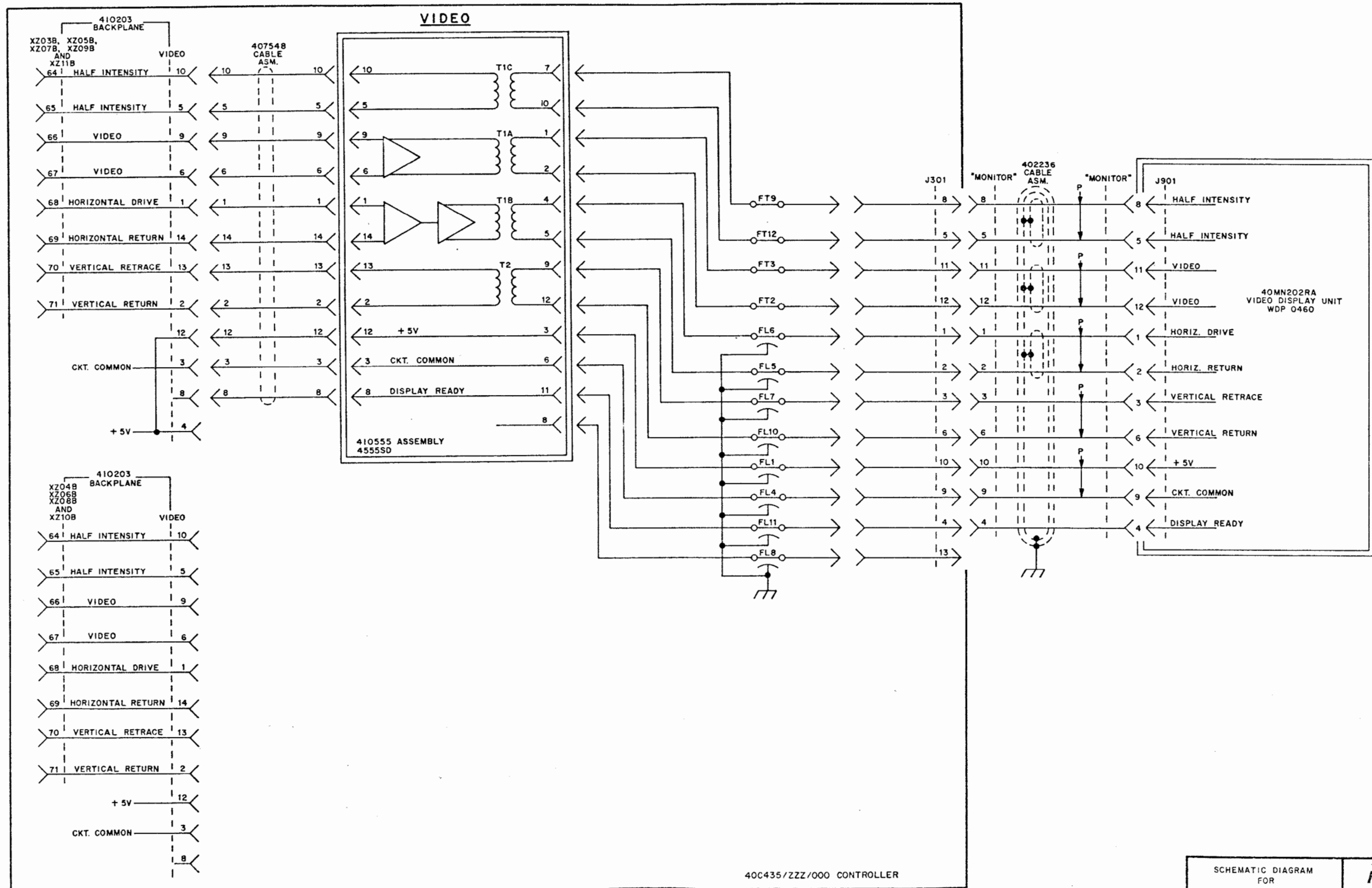
REFER TO 1657SD-B5 FOR SSI CONNECTIONS TO OPCON

SCHEMATIC DIAGRAM
FOR
M40 RFI
KOPM3 SETS
WITH 40C435 CONTROLLER

TELETYPE
1657SD-B6

VIDEO INTERFACE

ISSUE
1



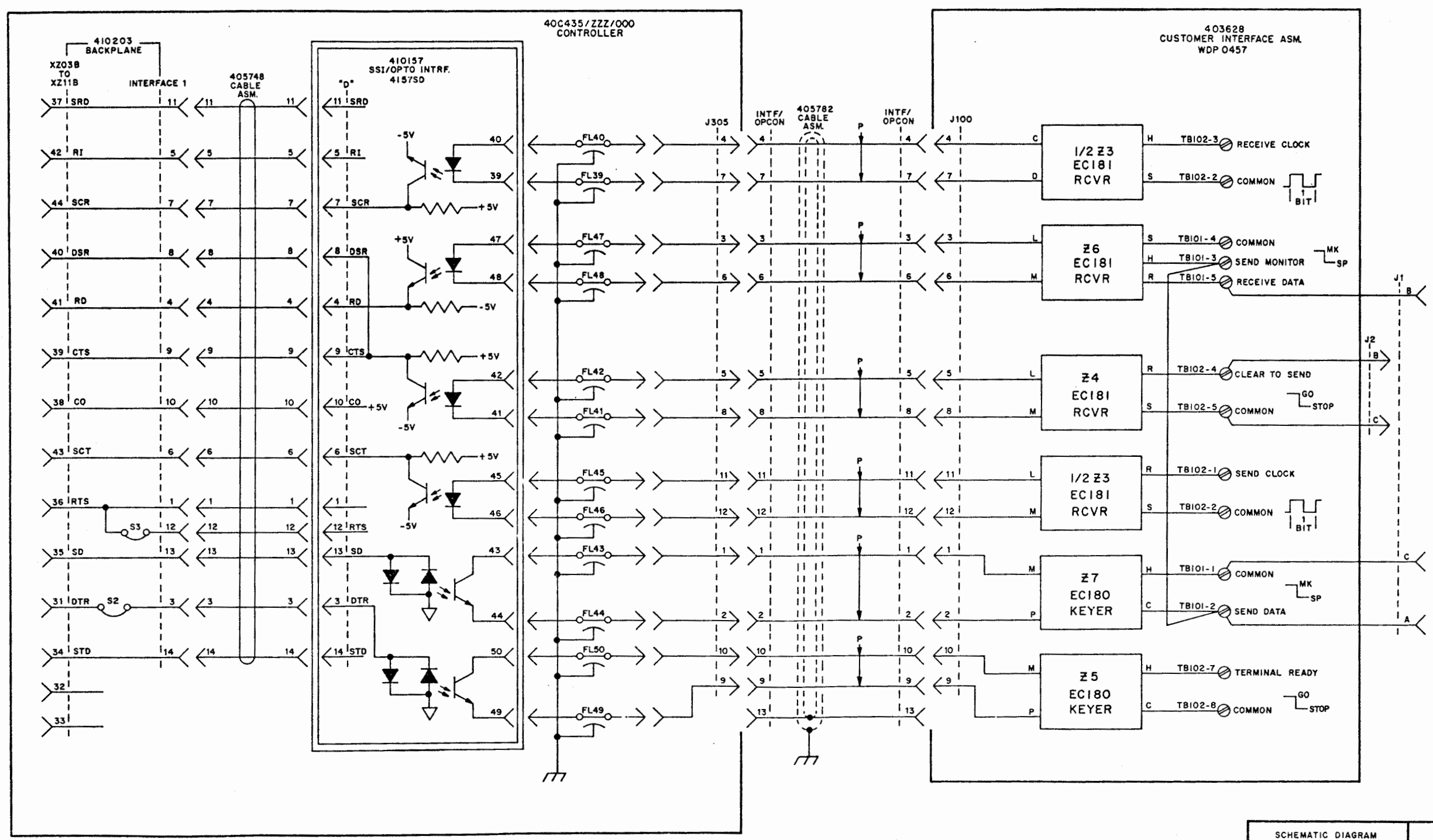
SCHEMATIC DIAGRAM
FOR
M40 RFI
KOPM3 SETS
WITH 40C435 CONTROLLER



1657SD-B7

COMMUNICATIONS INTERFACE PREDESTAL INTERFACE

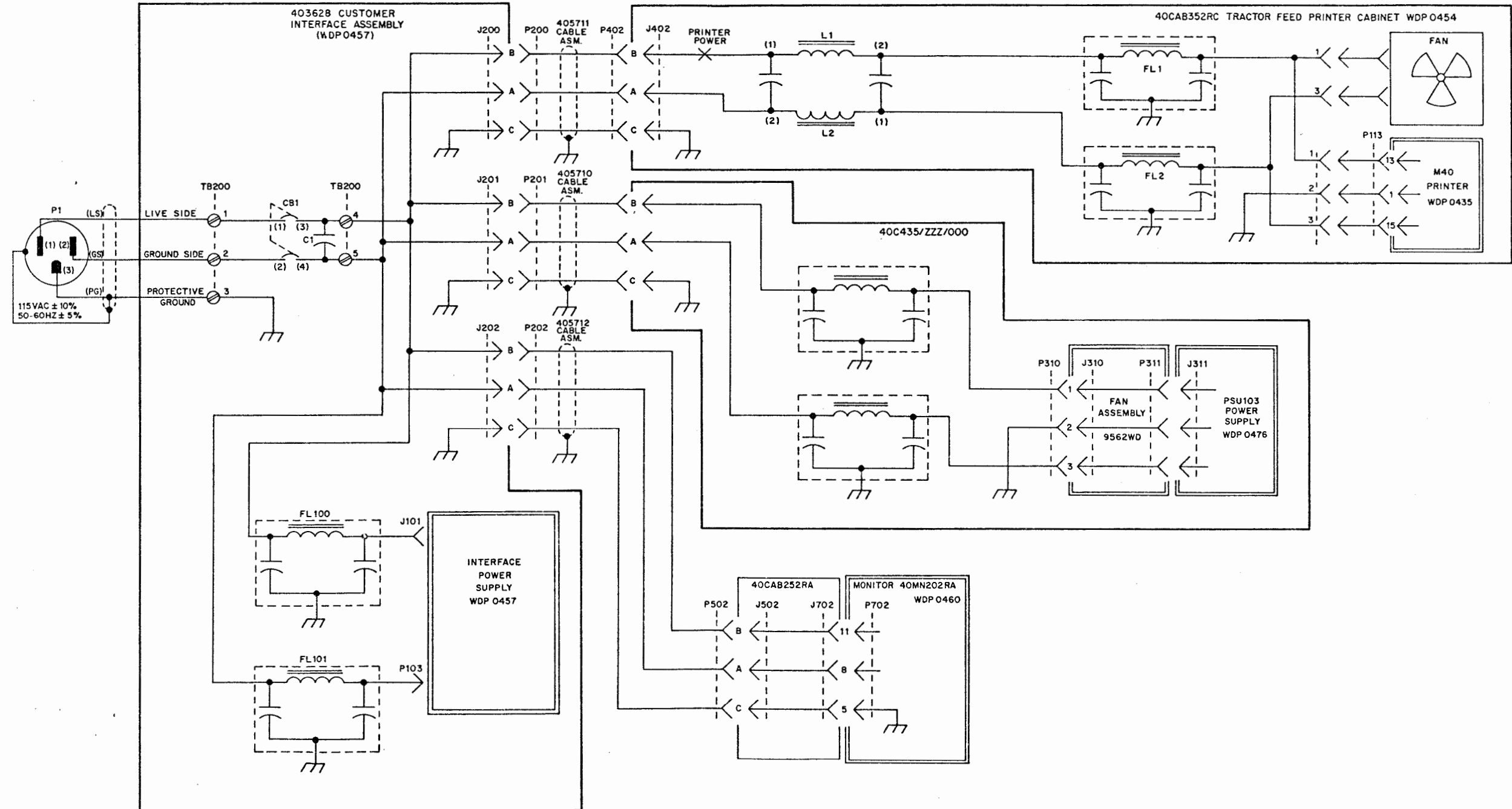
ISSUE
1



SCHEMATIC DIAGRAM
FOR
M40 RFI
KDPN3 SETS
WITH 40C435 CONTROLLER

TELETYPE
1657SD-B8

AC CIRCUITS



SCHEMATIC DIAGRAM
FOR
M40 RFI
KDFM3 SETS
WITH 40C435 CONTROLLER



1657SD-B9

ISSUE
1

A

B

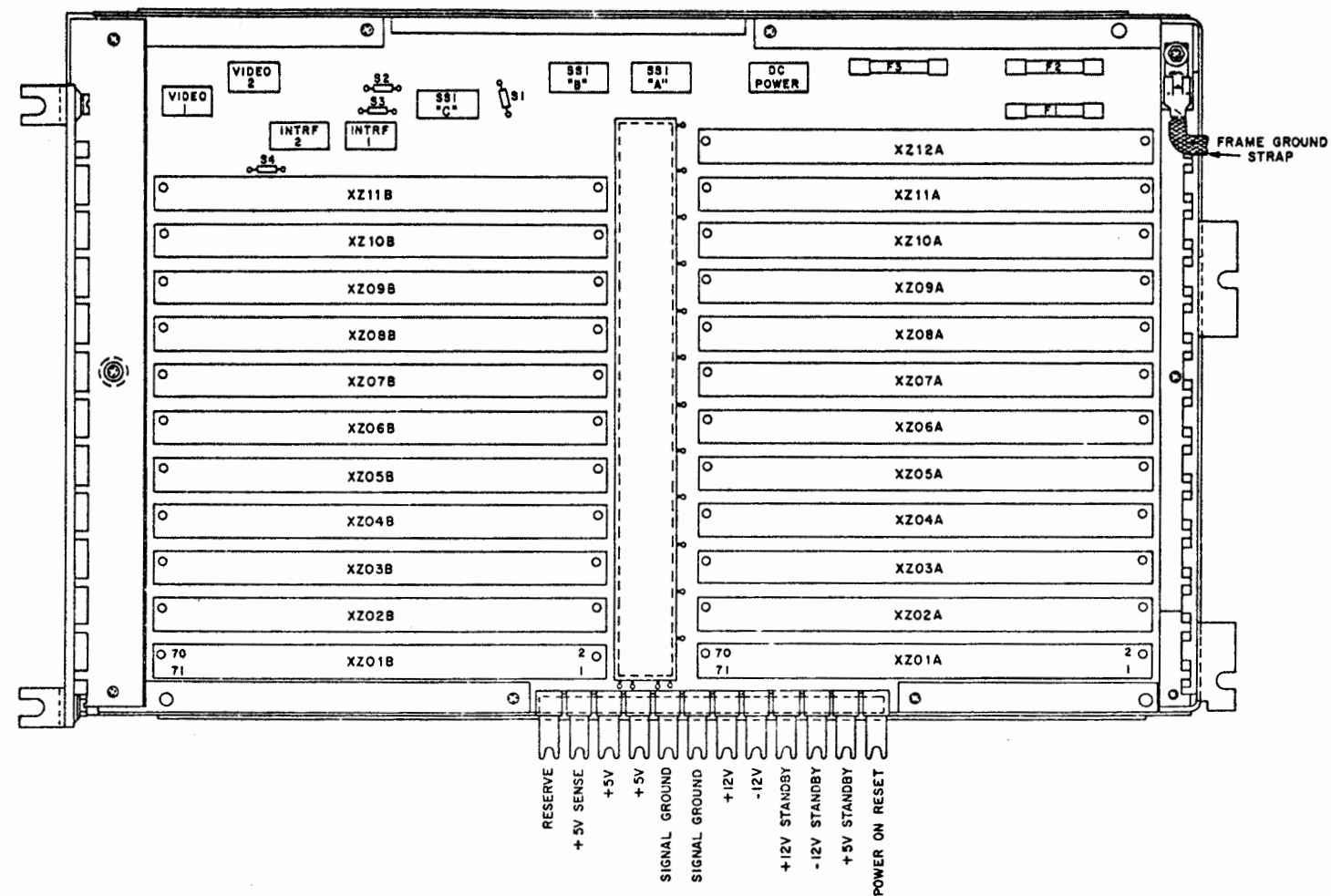
C

D

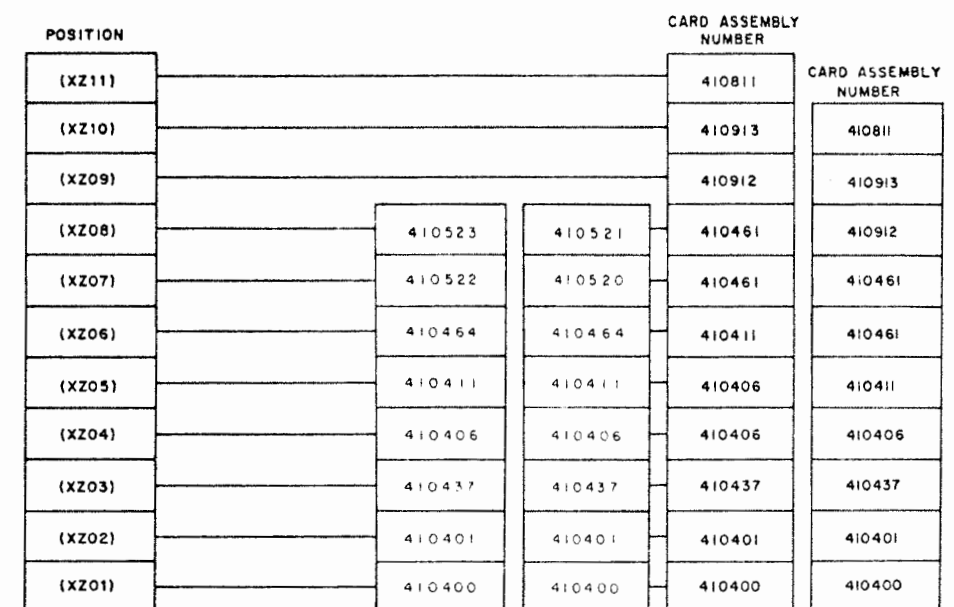
E

APP. FIG. 1

410203 CARD ASSEM.
VIEWED FROM COMPONENT
SIDE



CARD SET



CARD SET FOR
40C435/AEE/099
WDP 0542

CARD SET FOR 40C 435/AEE/091
WDP 0495

CARD SET FOR 40C435/AEB/088
WDP 0489

CARD SET FOR 40 C435/ACS/059

SCHEMATIC DIAGRAM
FOR
M40 RFI
KOPM3 SETS
WITH 40C435 CONTROLLER



1657SD-B10

		SHEET INDEX																														
		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		
A	SHEET INDEX SUPPORTING INFORMATION		A-1	1	2	3	4	5	6	7	8	9	10	11	12	13																A-1
	FS-1 TRANSFORMER DIODE ASSEMBLY		B-1	1	2	2	3	3	3	3	3	3	3	4	4	4																B-1
	FS-2 AC TO DC CONVERTER		B-2	1	2	2	3	3	4	5	5	5	5	5	5	6																B-2
	FS-3 +5V REGULATOR		B-3	1	1	2	3	4	4	4	4	4	4	4	5	5																B-3
	FS-4 ±12V REGULATOR		B-4	1	1	1	2	2	3	3	4	5	6	6	7	7																B-4
B	CIRCUIT NOTES EQUIPMENT NOTES INFORMATION NOTES		D-1	1	1	1	2	2	3	4	5	6	7	8	9	10																D-1
	VOLTAGE CURRENT WAVE FORMS		E-1	1	1	1	2	2	2	2	2	2	2	2	2	2																E-1
	FS BLOCK DIAGRAMS		H-1	1	1	1	2	2	2	2	2	2	2	2	2	2																H-1
C																																
D																																
E																																

SUPPORTING INFORMATION

CATEGORY

NO.

WIRING DIAGRAM FOR MODEL 40
POWER SUPPLIES 40PSU102 &
40PSU103

WDP 0455

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 UPDATED EACH TIME ANY SHEET OF THE DRAWING IS REISSUED OR A NEW SHEET IS ADDED.
3. THE LAST COMPLETED COLUMN INDICATES THE LATEST ISSUE NUMBER OF THE SHEET INDEX.
4. SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NO.
5. ISSUE DATES WILL BE SHOWN ON THE SHEET INDEX ONLY.

POWER SUPPLY

MODEL 40

40PSU102

40PSU103

APPROVALS

PROJ. SUPV.

PROJ. DIR.

MFG. REL. COMPL.

ENGR.

DSGNR.

DATE

R & D FILE 1-33 172AA

S-NUMBER

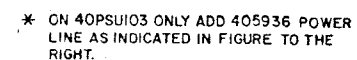
TELETYPE

1381 SD-AI

TC 641 (3-69)

21

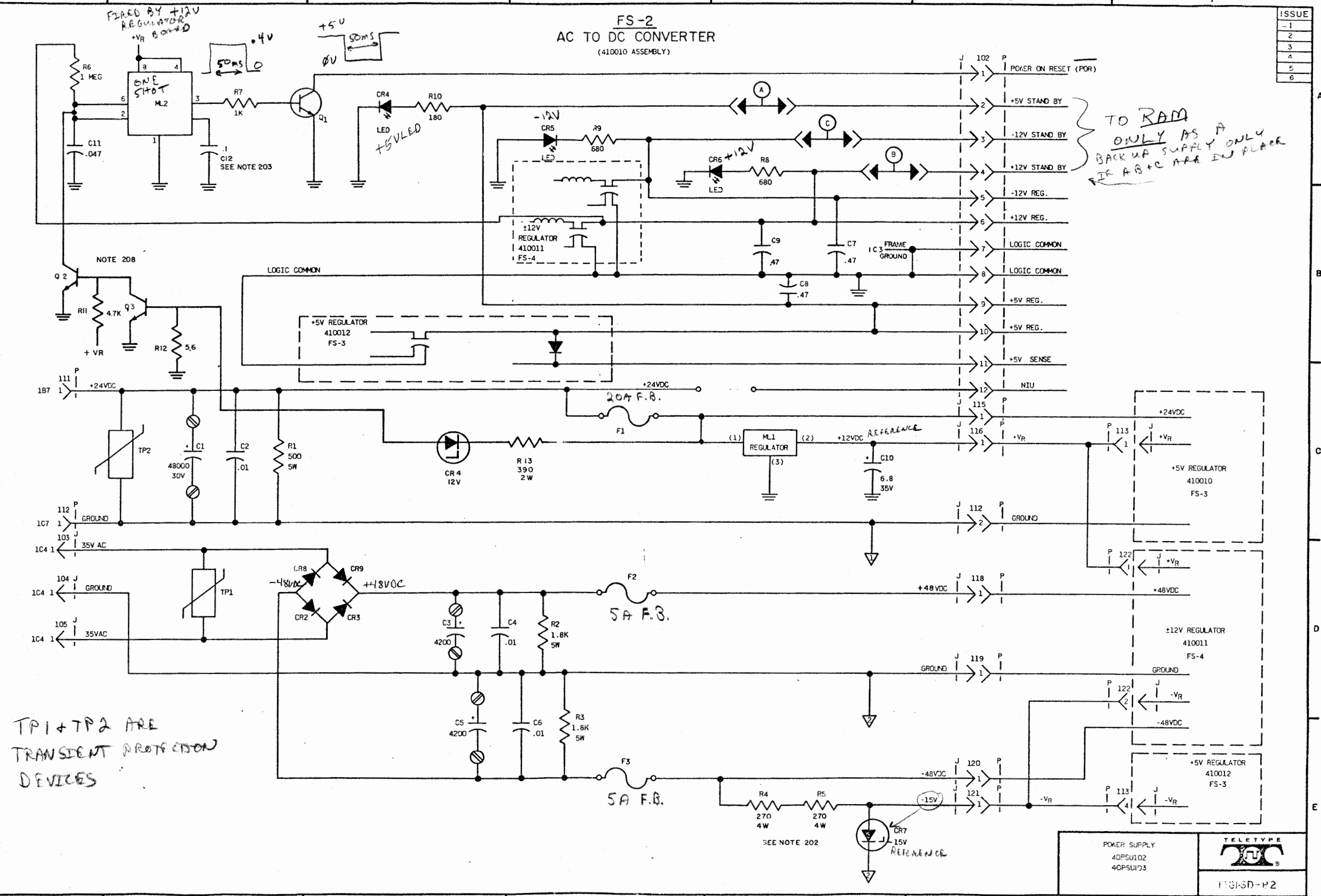
TRANSFORMER - DIODE ASSEMBLY

A

1381SD - B1

ISSUE
1
2
3
4
5
6

FS-2 AC TO DC CONVERTER (410010 ASSEMBLY)



POWER SUPPLY 40PSU102 40PSU103	TELETYPE 101SD-P2
--------------------------------------	--------------------------

REGULATES FROM OVER VOLTAGE OR CURRENT

Q8, ML3, R15, R18, CR4, R19
R20, R21, C9, C5

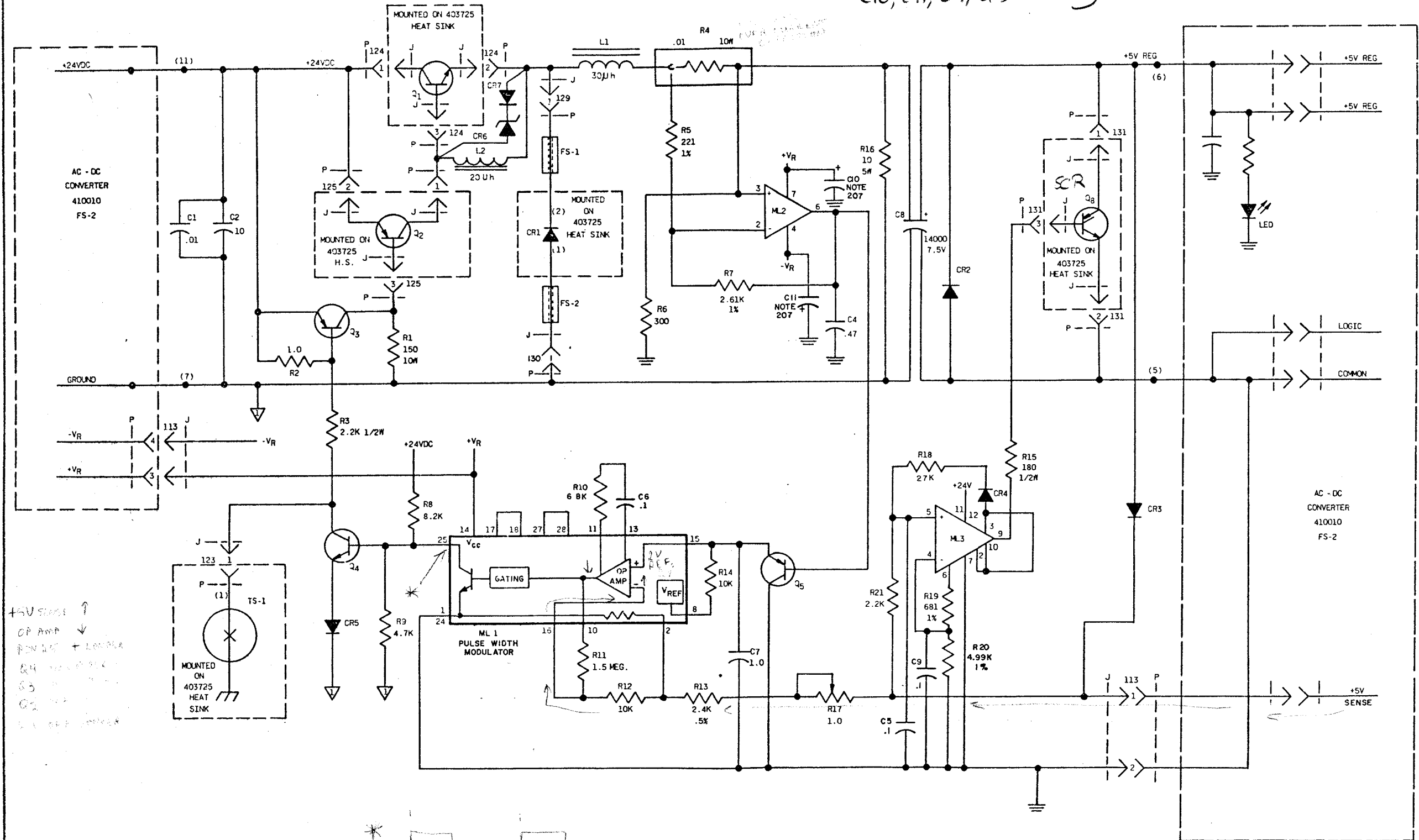
OVER VOLTAGE
PROTECTION

FS-3
+5 VOLT REGULATOR
(410012 ASSEMBLY)

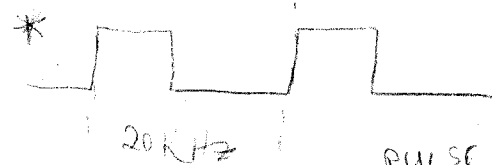
R4, R5, R6, R7, ML2,
C10, C11, C4, Q5

OVER CURRENT PROTECTION

ISSUE
1
2
3
4
5



+5V SENSE ?
OP AMP
PULSE + LOGIC
Q4
Q3
Q2
Q1



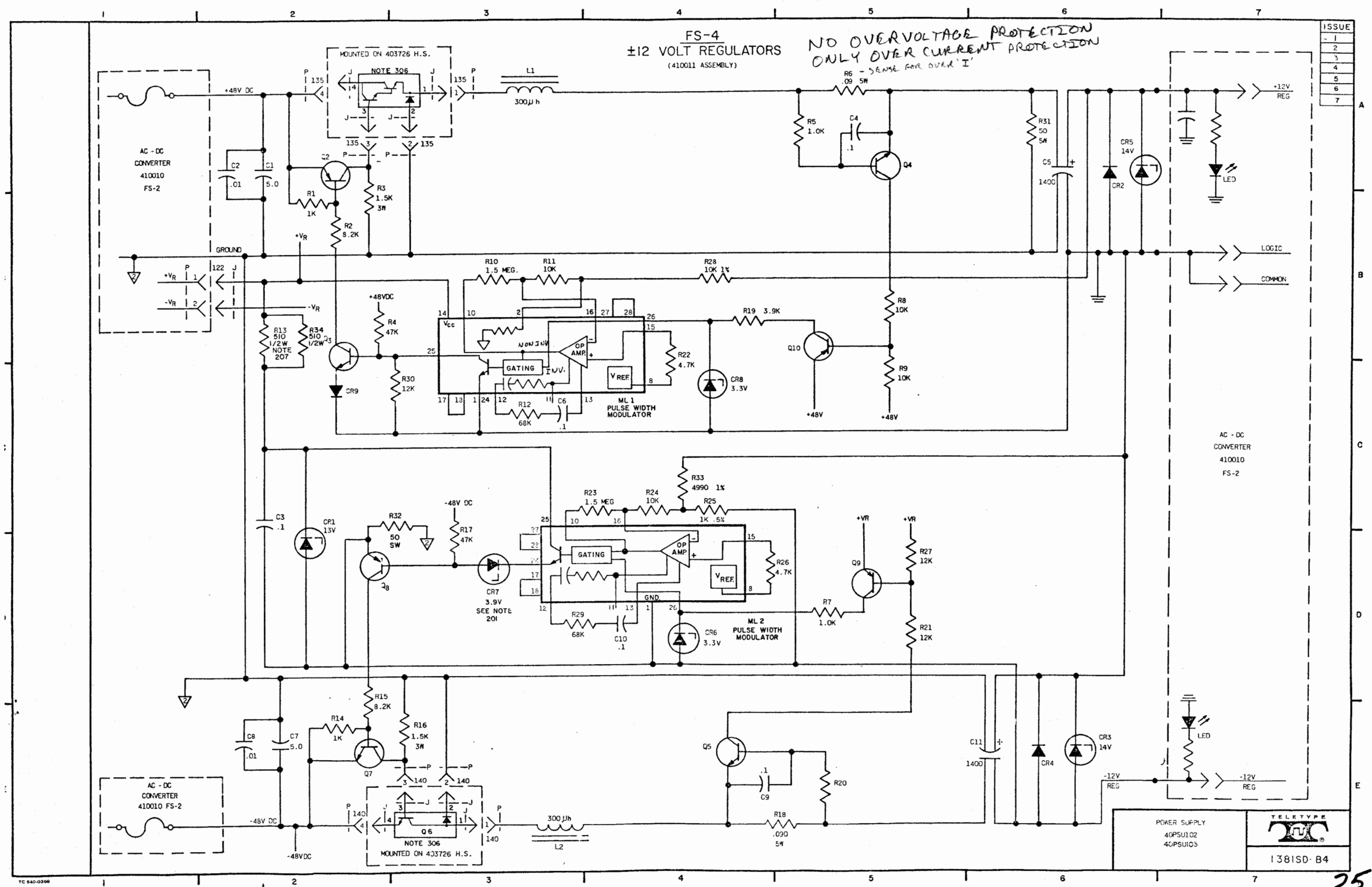
PULSE WILL VARY FROM 2% OF DUTY CYCLE
TO A MAX OF 50%

POWER SUPPLY
40PSU102
40PSU103



1381SD B3

Q4, R5, R6, C4, Q10, } OVER I FOR
CR8, R8, R9, R19 }



ISSUE
1
2
3
4
5
6
7
8
9
10

101. CIRCUIT NOTES:

DESIG.	FUSE AMP	POTENTIAL
CB-1	7.5A	115V AC
F2	20A	24V DC
F3	5A	48V DC
F4	5A	48V DC

BATTERY SYMBOL	VOLTAGE RANGE
+VR	11.5 - 12.5
-VR	13.5 - 16.5
+24V DC	18.5 - 30.0
+48V DC	+40V - +60V DC
-48V DC	-40V - -60V DC
+5V DC	4.75 - 5.25
12V DC	11.40 - 12.60
-12V DC	-11.40 - -12.60
115V AC	103V - 127V AC

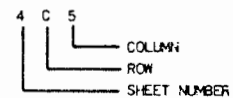
102. OPTIONS	PROVIDE	
	FS - LOG	OPTION
+5V STAND BY	FS-1	A
+12V STAND BY	FS-1	B
-12V STAND BY	FS-1	C

EQUIPMENT NOTES

201. ZENER DIODE WAS CHANGED TO ASSURE START UP OF -12V REGULATOR IF LOAD IS REFERENCED TO A MORE POSITIVE VOLTAGE THAN GROUND.
202. RESISTORS R4 AND R5 WERE CHANGED IN VALUE FROM 150 OHMS 10 WATTS TO 270 OHMS 4 WATTS. THIS REDUCED POWER DISSIPATION IN RESISTORS DUE TO REDUCED CURRENT NEEDED ON -VR CIRCUITS.
203. CAPACITOR C12 WAS ADDED TO PREVENT FALSE TRIPPING OF ML2 DUE TO NOISE.
204. INTERACTION BETWEEN +12V AND -12 REGULATORS WAS REDUCED BY REMOVING C12, C13 AND USING INTERNAL COMPENSATION (PIN 12) OF ML1 AND ML2.
205. RESISTOR R32 WAS REDUCED IN VALUE TO ASSURE REGULATOR WILL OPERATE UNDER NO LOAD CONDITIONS DURING INITIAL TESTING.
206. CIRCUIT BREAKER CB-1 CHANGED FROM PUSH ON-PULL OFF TYPE TO U/L RECOGNIZED AND CSA CERTIFIED TOGGLE TYPE.
207. AT CUSTOMER I.D. ISSUE 12, COMPONENTS WERE REPOSITIONED ON ALL CIRCUIT CARDS FOR EASE OF MANUFACTURING. CAPACITORS C10, C11 WERE ADDED TO 410012 FOR ADDITIONAL FILTERING ON +VR AND -VR. RESISTOR R34 WAS ADDED TO 410011 AND R13 CHANGED TO 1/2W FOR MACHINE INSERTION.
208. COMPONENTS Q2, Q3, CR4, R11, R12, R13 WERE ADDED TO ASSURE A POR SIGNAL DURING A BROWN-OUT CONDITION.

INFORMATION NOTES:

301. SHEET COORDINATE LOCATION LEGEND



302. TERMINALS DESIGNATION ENCLOSED IN PARENTHESIS ARE NOT MARKED ON THE COMPONENT.
303. ALL RESISTORS ARE 1/4W AND ALL IN OHMS UNLESS OTHERWISE SPECIFIED.
304. ALL CAPACITORS VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

305. INDICATES +24V DC GROUND

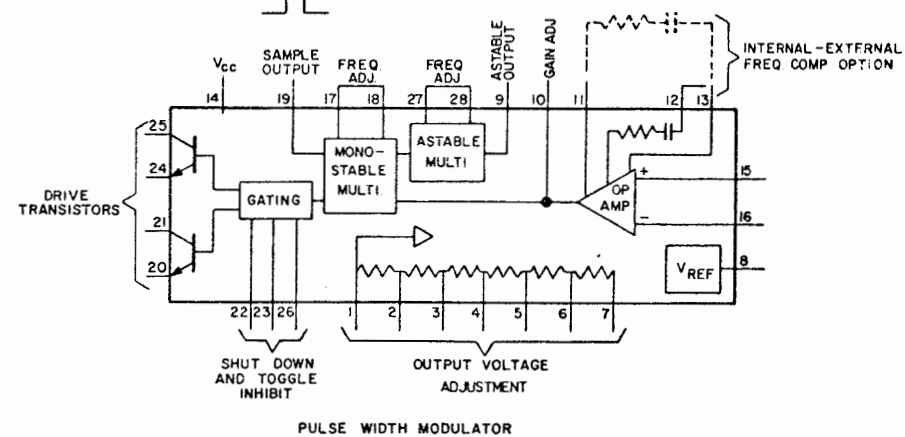
- INDICATES ±48V DC GROUND

- INDICATES FRAME GROUND

- INDICATES LOGIC COMMON

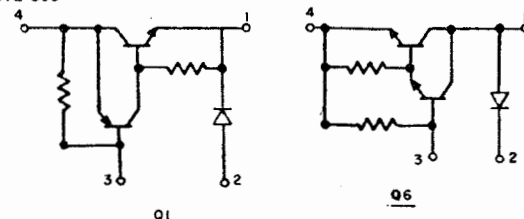
- INDICATES TRANSIENT PROTECTOR

- INDICATES FOUR TERMINAL LOW INDUCTANCE CAPACITOR



- INDICATES FERRITE SLEEVE

NOTE 306



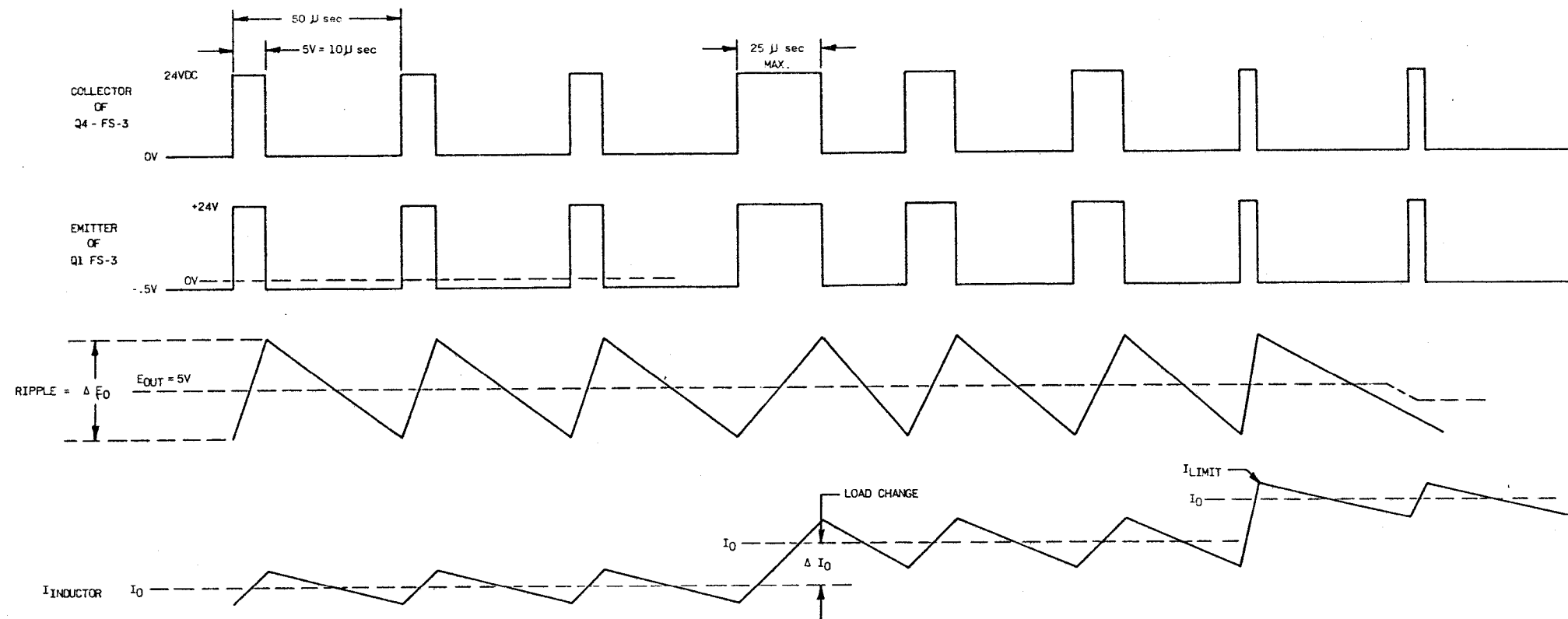
POWER SUPPLY
40PSU102
40PSU103



1381SD-D1

ISSUE
1
2

TC-1 VOLTAGE - CURRENT DIAGRAM



POWER SUPPLY
40PSU102
40PSU103

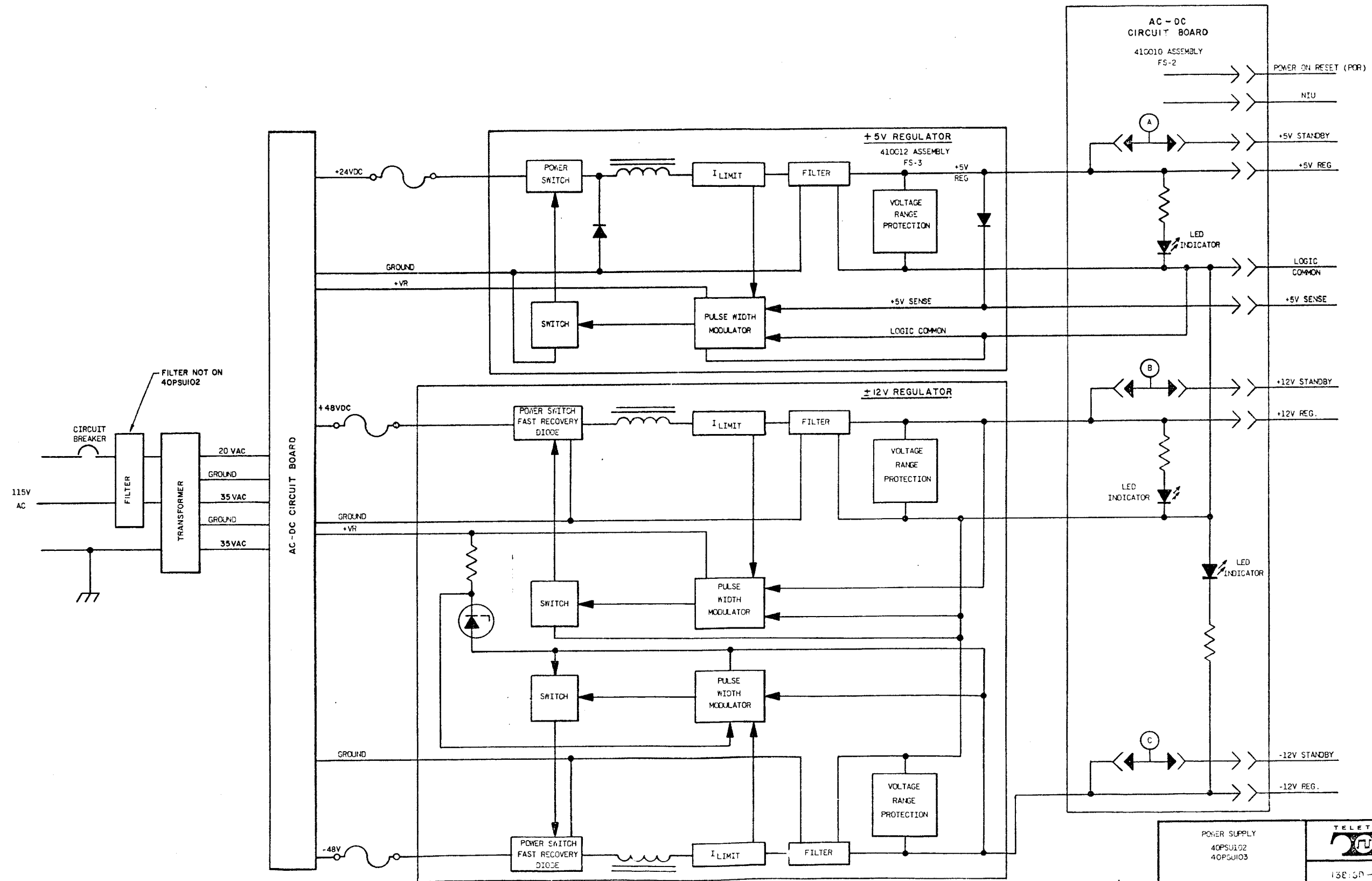


1381SD-EI

BD-1 BLOCK DIAGRAM

ISSUE
1
2

A
B
C
D
E



POWER SUPPLY
40PSUI02
40PSUI03



[illegible]

CATEGORY	NO.
ASSEMBLY DRAWING	410555
	WDP476
	WDP52
	WDP48
	WDP486

WHEN CHANGES ARE MADE IN THIS DRAWING

1. ONLY CHANGED SHEETS WILL BE REISSUED. (INCLUDING SHEET 1)
2. UNCHANGED SHEETS RETAIN EXISTING ISSUE NUMBER.

THE LAST COMPLETED COLUMN ON THE SHEET INDEX INDICATES THE LATEST ISSUE PER SHEET

ISSUE	DATE	AUTH. NO.
1	1-19-76	24280R
2	6-7-76	16233
3	8-11-78	20494

1. ALL RESISTORS $\frac{1}{4}$ WATT AND ALL VALUES IN OHMS $\pm 5\%$ UNLESS OTHERWISE NOTED.
2. ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. L1, L2, L3, L4 AND L6 ARE FERRITE SLEEVE RF CHOKES.

THIS CIRCUIT CARD ASSEMBLY CONSISTS MAINLY OF AMPLIFIERS AND TRANSFORMERS NEEDED TO TRANSPORT VIDEO, HIGHLIGHT, HORIZONTAL AND VERTICAL SIGNALS FROM THE DISPLAY I/O BOARD IN THE CONTROLLER TO THE TRANSMISSION CABLE AND ULTIMATELY TO THE MONITOR.

THE VIDEO SIGNAL APPEARS ON PINS 6 AND 9 OF THE DUAL-IN-LINE CONNECTOR. THE DIFFERENTIAL SIGNAL IS APPLIED TO AMPLIFIER M1-9, IO R1 IS A TERMINATING RESISTOR. C1 AND C2 ARE WAVEFORM CORRECTING CAPACITORS. THE OUTPUT OF M1-7 IS APPLIED TO ONE INPUT M1-4 AND IS DELAYED IN A DELAY LINE AND APPLIED TO THE SECOND INPUT M1-5. CAPACITOR C12 AND C13 AND COIL L5 MAKE UP THE DELAY LINE. R2 AND R12 STABILIZE THE IMPEDANCE OF THE LINE AND FERRITE SLEEVE L6 AND R11 ACT AS RING DAMPERS. THE TWO SIGNALS APPLIED TO M1 ONE NORMAL AND THE OTHER IN PHASE BUT DELAYED FROM THE NORMAL SIGNAL, COMBINE IN M1 AND THE RESULTANT IS A DIFFERENTIATED OUTPUT. THIS SIGNAL IS COUPLED THROUGH T1A TO PINS J1 AND J2. R3 AND R4 PROVIDE CORRECT AMPLIFIER OUTPUT IMPEDANCE TO GROUND. C3 REDUCES HIGH FREQUENCY TRANSIENTS.

THE HORIZONTAL DRIVE SIGNAL APPEARS ON PINS 1 AND 14 OF THE CONNECTOR. R5 IS A LINE TERMINATING RESISTOR AND R6 AND R7 SET THE INPUT VOLTAGE OF MLI-13. MLI-14 AND 15 ARE THE AMPLIFIED HORIZONTAL DRIVE OUTPUTS AND THESE DRIVE TRANSFORMER T1-B. R8 AND R9 PROVIDE CORRECT AMPLIFIER OUTPUT IMPEDANCE TO GROUND AND C8 REDUCES HIGH FREQUENCY TRANSIENTS.

THE HIGHLIGHT SIGNAL INPUT APPEARS ON PINS 5 AND 10 OF THE DUAL IN-LINE CONNECTOR AND DRIVES TRANSFORMER T1-C. R13 AND R14 PROVIDE CORRECT AMPLIFIER OUTPUT IMPEDANCE TO GROUND AND C9 REDUCES HIGH FREQUENCY TRANSIENTS.

THE VERTICAL SYNC. INPUT APPEARS AT PINS 13 AND 2 OF THE CONNECTOR AND IS CURRENTLY LIMITED BY R10 AND DRIVES TRANSFORMER T2. THE COMBINATION R10 AND C11 FORM A LOW PASS FILTER TO REDUCE HIGH FREQUENCY TRANSIENTS. THE COMBINATION OF L4 AND C10 PROVIDE A DECOUPLING NETWORK TO ISOLATE NOISE ON THE VERTICAL LINE FROM THE +5 VOLT SUPPLY.

THE COMBINATION OF L1 AND C5 SERVE TO CHOKE OUT ANY HIGH FREQUENCY NOISE THAT MAY BE ON THE +5 VOLT CABLE GOING TO THE MONITOR. CHOKE L2 ISOLATES ANY GROUND NOISE ON THE MONITOR CABLE FROM ENTERING THIS CARD. THE COMBINATION L3 AND C6 CHOKES OUT ANY NOISE ON THE DISPLAY READY LINE AS IT ENTERS THIS CIRCUIT CARD.

CC 555

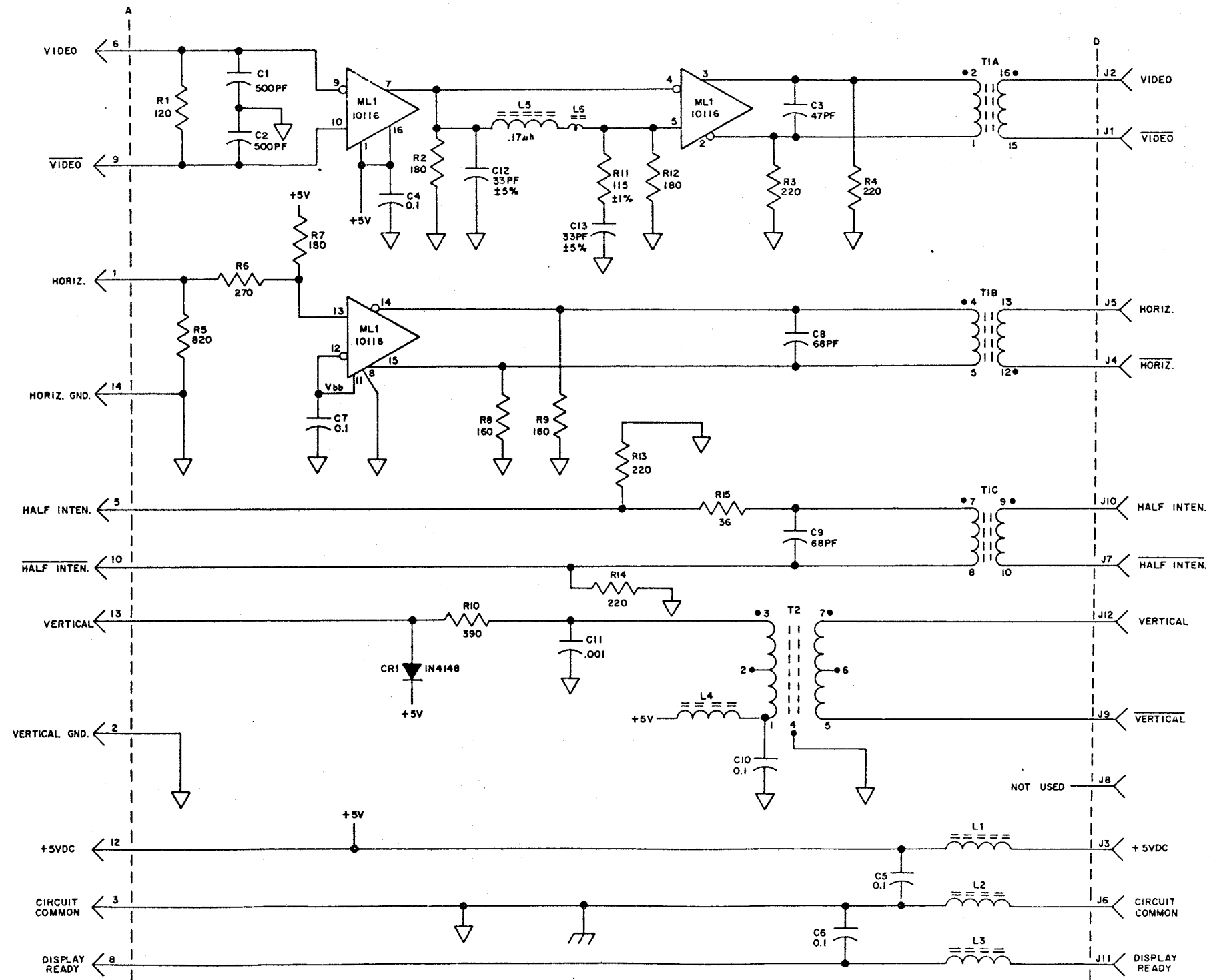
PROJ. SUPV. 441	PROJ. DIR. [Signature]	MFG. REL. COMPL. AIB
ENGR. WBL	DSGMR. WBL	
DRN. E.M.R.	DATE 11-14-75	
R & D FILE G-65.172AA		
S-NUMBER		



4555SD-AI

ISSUE
1
2
3

FS-1 VIDEO INTERFACE SENDER



40C430 ZZZ 000 1308SD	
BLUE	12
PURPLE	11
WHITE-ORANGE	2
ORANGE	1
LOGIC MODULE FEED-THRU PANEL	
GREEN	5
WHITE-GREEN	8
YELLOW	6
WHITE-YELLOW	3
BROWN	13
SLATE	10
BLACK	9
WHITE-BROWN	4

SCHEMATIC
WIRING DIAGRAM
FOR
VIDEO INTERFACE
SENDER



4555SD-B1

	2	3	4	5	6
	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995

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		
SHEET INDEX, SUPPORTING INFORMATION AND GENERAL NOTES.	A1	1	2	3																								A1
FS-1 SSI AND CUSTOMER ISOLATORS	B1	1	2	3																								B1

SUPPORTING INFORMATION	
CATEGORY	NO.
ASSEMBLY DRAWING	410157

USE OF SHEET INDEX
WHEN CHANGES ARE MADE IN THIS DRAWING:
1 ONLY CHANGED SHEETS WILL BE REISSUED (INCLUDING SHEET 1)
2 UNCHANGED SHEETS RETAIN EXISTING ISSUE NUMBER
THE LAST COMPLETED COLUMN ON THE SHEET INDEX INDICATES THE LATEST ISSUE PER SHEET.

USE OF SHEET INDEX

WHEN CHANGES ARE MADE IN THIS DRAWING

- 1 ONLY CHANGED SHEETS WILL BE REISSUED (INCLUDING SHEET 1)
- 2 UNCHANGED SHEETS RETAIN EXISTING ISSUE NUMBER

THE LAST COMPLETED COLUMN ON THE SHEET INDEX INDICATES THE LATEST ISSUE PER SHEET.

[illegible]

GENERAL NOTES:

1. ALL RESISTORS 1/4 WATT AND RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITANCE VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3.  INDICATES FEMALE TERMINALS.
4.  INDICATES MALE TERMINALS.
5. CAPACITOR C4 ADDED AT CUSTOMER 10 ISSUE 1B
6. CAPACITOR C4 CHANGED FROM 100 PF TO 100 PF, AND RESISTOR R5 CHANGED FROM 390 K TO 1MEG AND TRANSFORMERS T5, T6, T7, AND T8 ADDED AT CUSTOMER ISSUE 2A

SCHEMATIC
WIRING DIAGRAM
FOR
410157 CIRCUIT
CARD ASSEMBLY

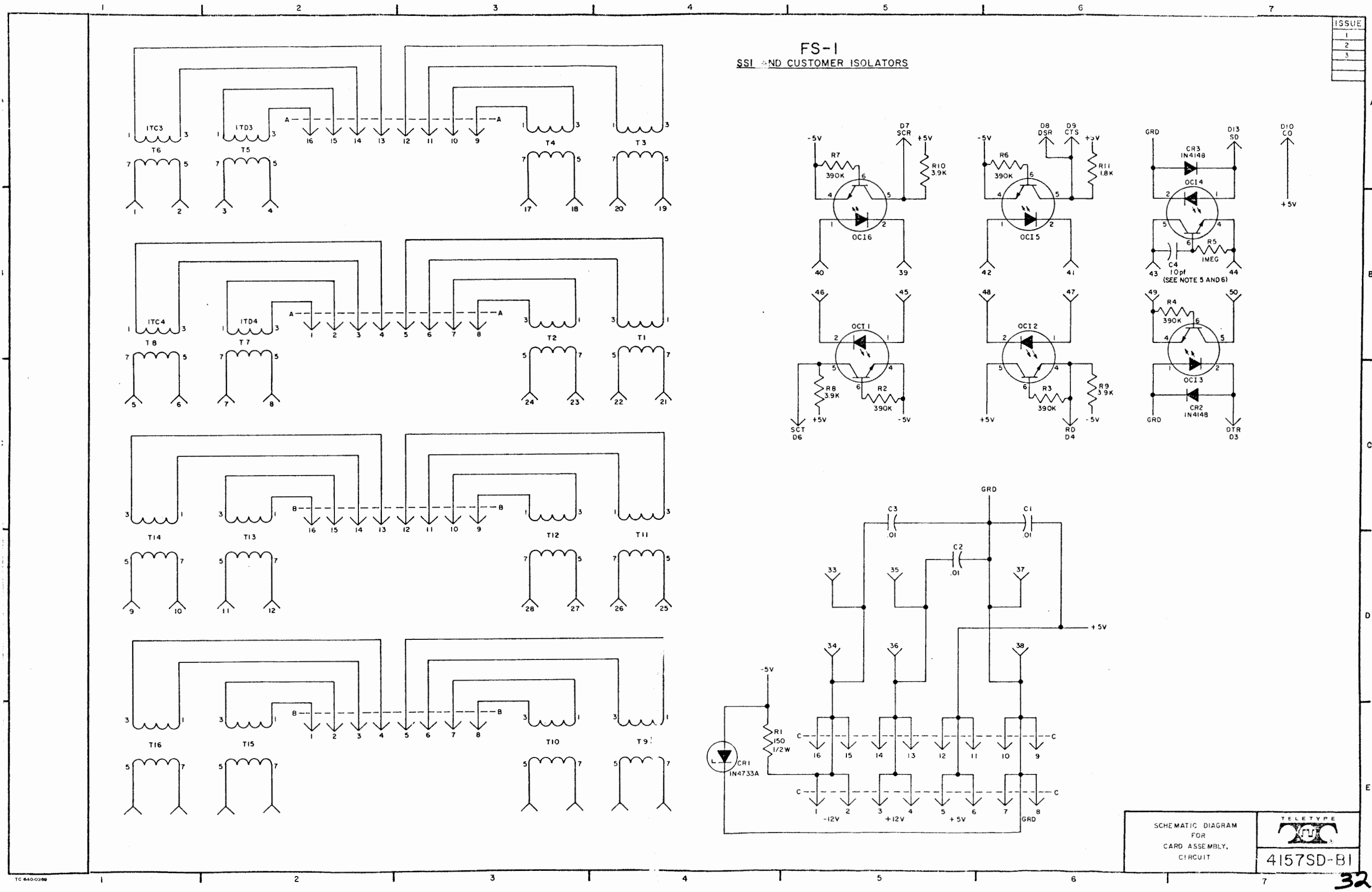
APPROVALS

PROJ. <u>22</u>	PROJ. <u>DIR</u>	MFG REL. <u>COMPL</u>
ENGR. <u>—</u>	DSGNR. <u>FJS</u>	
ORN. <u>FJS</u>	DATE <u>1-11-77</u>	
R & D FILE <u>G-65.172AA</u>		
S-NUMBER		

TELETYPE



4157SD-A1



FS-1
SSI AND CUSTOMER ISOLATORS

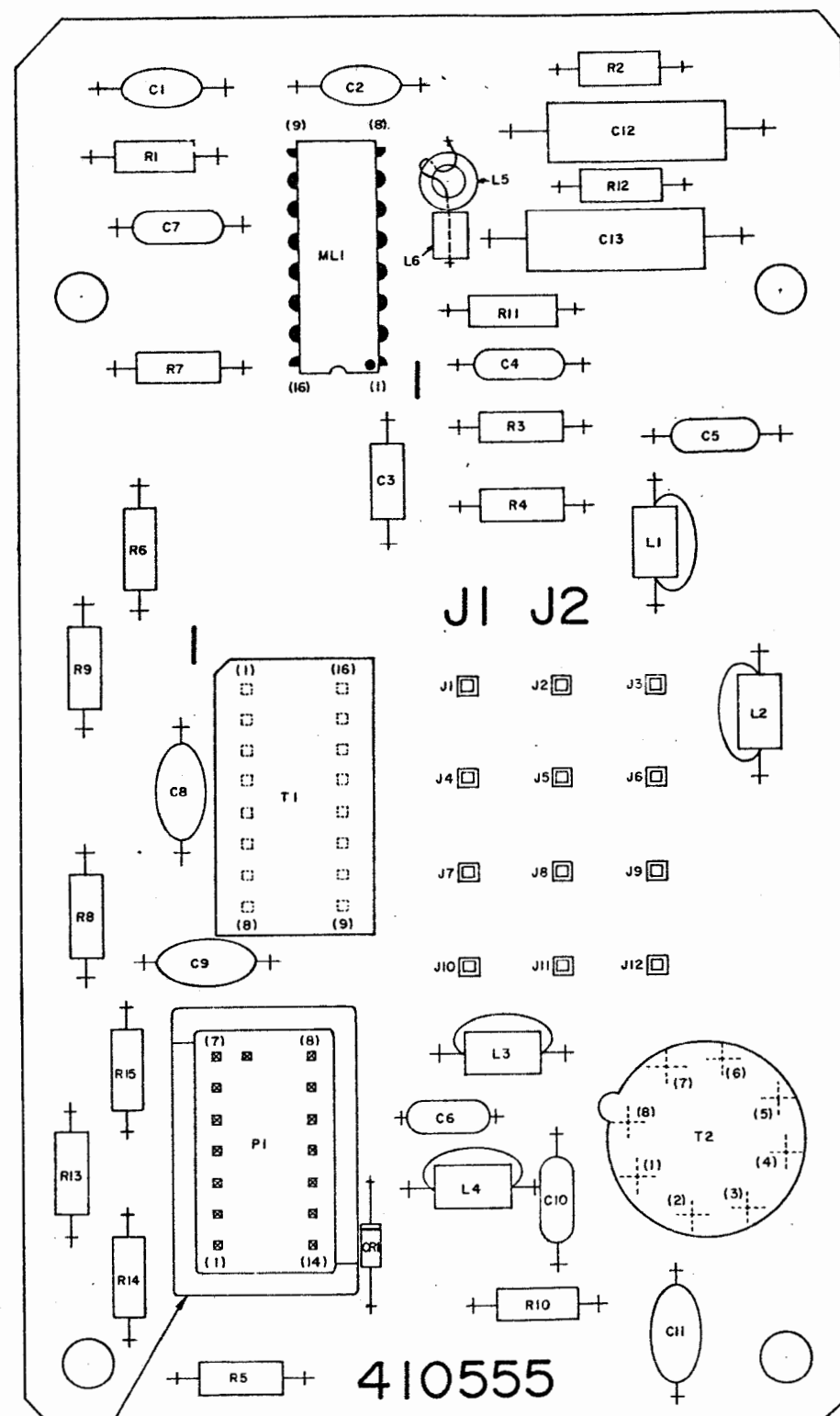
ISSUE
1
2
3

SCHEMATIC DIAGRAM
FOR
CARD ASSEMBLY,
CIRCUIT

TELETYPE
4157SD-B1

REF. DESIG.	PART NO. REQ.	QTY	DESCRIPTION
R1	315948	1	100Ω 5% 1/4 W
R2	328783	3	180Ω 5% 1/4 W
R3	318902	4	220Ω 5% 1/4 W
R4			SAME AS R3
R5	315952	1	820Ω 5% 1/4 W
R6	328784	1	270Ω 5% 1/4 W
R7			SAME AS R2
R8	323193	2	160Ω 5% 1/4 W
R9			SAME AS R8
R10	315950	1	390Ω 5% 1/4 W
R11	337497	1	115Ω 1% 1/4 W
R12			SAME AS R2
R13			SAME AS R3
R14			SAME AS R3
R15	326599	1	36Ω 5% 1/4 W
C1	321157	2	500 PF 1000 WVDC
C2			SAME AS C1
C3	335799	1	47μJF 200 WVDC
C4	305821	5	0.1μJF 25 WVDC
C5			SAME AS C4
C6			SAME AS C4
C7			SAME AS C4
C8	321518	2	68μJF 200 WVDC
C9			SAME AS C8
C10			SAME AS C4
C11	328793	1	.001μJF 1000 WVDC
C12	346238	2	33μJF 5% 50 WVDC
C13			SAME AS C12
CR1	197464	1	IN4148 DIODE
L1	405849	4	RF CHOKE
L2			SAME AS L1
L3			SAME AS L1
L4			SAME AS L1
L5	403691	1	CORE (.17μH)
L6	343619	1	FERRITE SLEEVE
J1-J12	403611	12	VERTICAL PV RECEPTACLE
P1	341618	15	.025 SQ. CONNECTOR PIN
	341751	1	GUIDE, CONNECTOR
T1	403659	1	MULTIPLE VHF XFMR ASSEM.
T2	403658	1	PULSE XFMR - 2:1 C.T.
ML1	339716	1	ECL TRIPLE LINE RCVR.
	30053RM 8"		#29 AWG MAGNET WIRE
	409555	1	ETCHED CIRCUIT BOARD

NOTE: MANUFACTURE PER MR2001



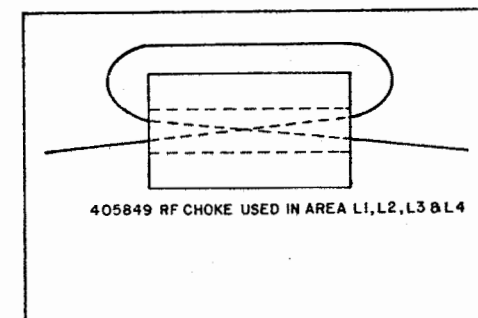
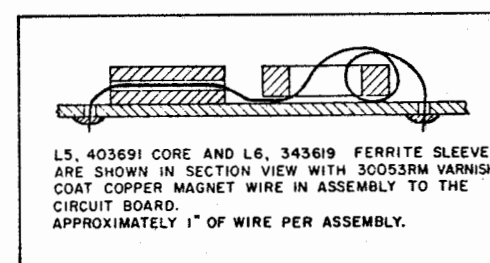
341751 GUIDE, CONNECTOR

410555

409555 ETCHED CIRCUIT BOARD

NOTES:

1. C12 & C13 WERE 300011 (30PF) WHICH HAS BEEN CANCELLED.



REVISIONS					
CUSTOMER IDENTIFICATION	ISSUE	DATE	DESCRIPTION	CONFORMANCE DATE	AUTH. NO.
1	A	5-20-75			23925-R
2	A	8-1-76			16233
2	B	3	2-28-78		20238
2	C	1	4		20494

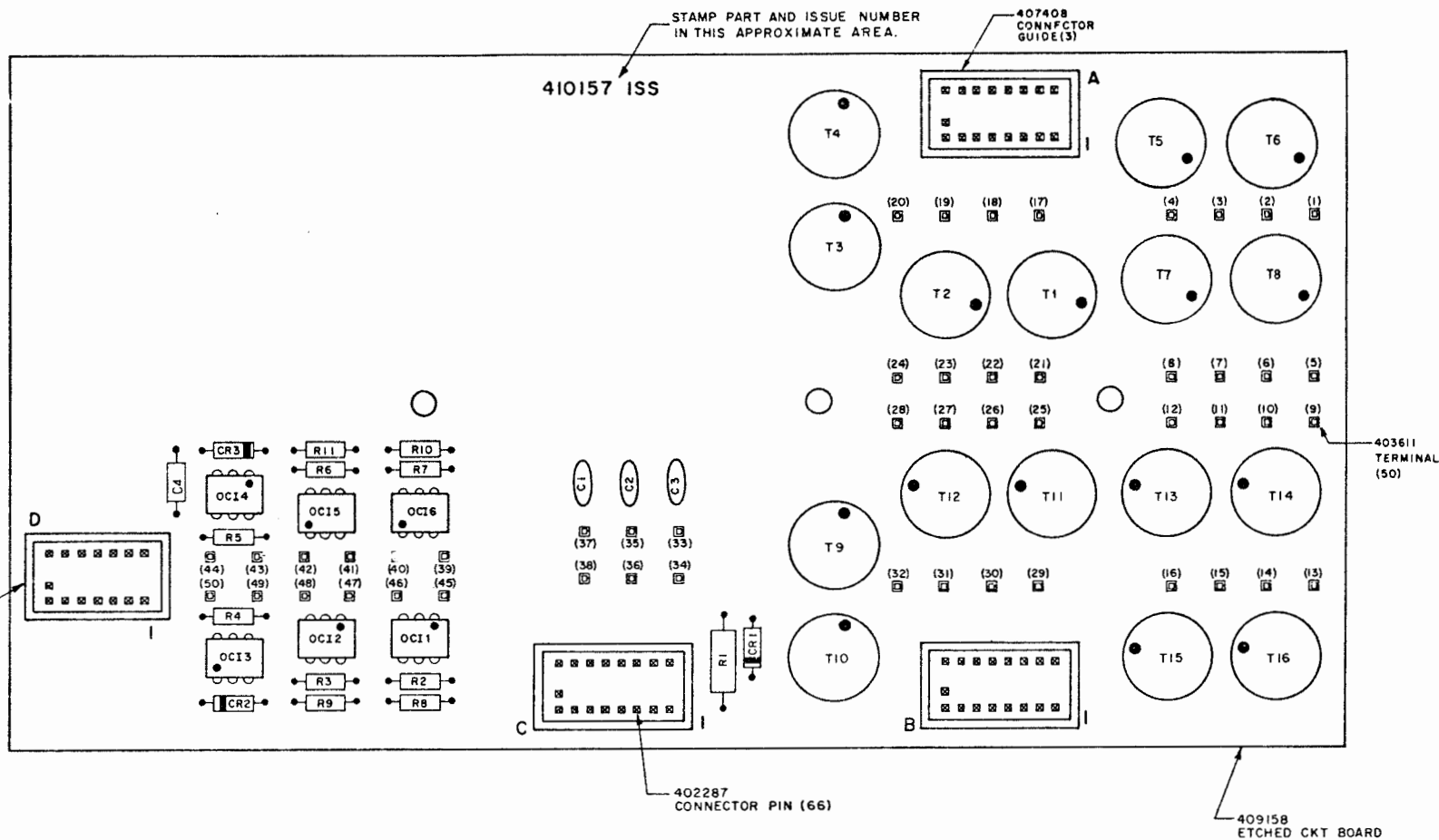
APPROVALS			
PROJ. SUPV.	PROJ. DIR.	MFG. REL. COMPL.	
ENGR. WBL	DSGNR. EMR		
DRAWN A.D	DATE 3-20-75		
E - NUMBER			
SD - CO NO 4555			
R & D FILE NO G-65.172 AA			

TELETYPE	
410555	

REF. DESIG.	PART NO REQ.	QTY	DESCRIPTION
R1	129856	1	RESISTOR 150 Ω .5W $\pm$ 5%
R2-R4	330544	3	RESISTOR, 390K .25W $\pm$ 5%
R8-R10	330226	3	RESISTOR, 3.9K .25W $\pm$ 5%
R11	321507	1	RESISTOR, 1.8K .25W $\pm$ 5%
R5	330641	1	RESISTOR, 1 MEG
R6, R7		2	SAME AS R2
C1-C3	319999	3	CAPACITOR, .01 100V
C4	346351	1	CAPACITOR, 10p
CR1	312922	1	DIODE, ZENER
CR2-CR3	197464	2	DIODE, 1N4148
T1-T16	403657	16	TRANSFORMER (5:1)
OC11-6	335522	6	OPTICAL ISOLATOR
	409158	1	BOARD, ETCHED CKT.
	403611	50	TERMINAL
	402287	66	PIN, CONNECTOR
	341751	1	GUIDE, CONNECTOR
	407408	3	GUIDE, CONNECTOR

NOTE: MANUFACTURE PER MR2001

341751
CONNECTOR
GUIDE



MANUFACTURING INFORMATION:

TERMINAL DESIGNATIONS ENCLOSED IN PARENTHESIS ARE FOR REFERENCE AND ARE NOT MARKED ON THE CIRCUIT BOARD.

NOTE:

1. CAPACITOR C4 ADDED TO NON-COMPONENT SIDE OF CARD BETWEEN TERMINAL 43 OC14-6 AT CUSTOMER ID ISSUE 1B.
2. C4 REMOVED FROM NON-COMPONENT SIDE, VALUE CHANGED FROM 100pF TO 10pF AND INCORPORATED INTO ARTWORK, R5 CHANGED FROM 390K TO 1 MEG, AND T5-T8 ADDED AT CUSTOMER ISSUE 2A.

SIMILAR TO: 410158

REVISIONS					
REV. NO.	DATE	BY	REASON	CONFORMANCE DATE	AUTH. NO.
1	2-8-77				24905-R
1	6-22-77				18552
2	9-11-78				18552-2

CIRCUIT CARD	
MC 157	
CARD ASM. CIRCUIT	

APPROVALS			
PROJ. SUPV.	PROJ. DIR.	MFG REL.	COMPL.
ENGR.	DSGNER.	FJS	
DRAWN	DATE	1-7-77	
E-NUMBER			
SD-CD NO.	4157		
R & D FILE NO.	G-65.172 AA		
TELETYPE			
410157			

SHEET INDEX AND ISSUE CONTROL	1381CD
-------------------------------	--------

Sheet 1

1000

THE 40PSU102 AND 40PSU103 POWER SUPPLIES

[illegible]

APPROVALS	ENG. R.E.A.	DSGMR.	DRN.
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DSG NR.	DRN.
---------	------

	S - NUMBER
--	------------

	E-NUMBER
--	----------

1381CD

TC482-1272

CIRCUIT DESCRIPTION FOR
THE 40PSU102 AND 40PSU103 POWER SUPPLIES

TABLE OF CONTENTS

SECTION I - GENERAL TECHNICAL DATA

1. PURPOSE AND OPERATION
2. SUPPORTING INFORMATION

SECTION II - DETAILED DESCRIPTION AND THEORY OF OPERATION

1. FRONT END DESCRIPTION
2. AC-DC CARD ASSEMBLY
 - 2.1 AC-DC Converters
 - 2.2 Converter Fusing
 - 2.3 Auxiliary Supply Voltages
 - 2.4 Power-On-Reset Signal
 - 2.5 "Run Lights"
 - 2.6 Output Connector
3. 12 VOLT REGULATOR ASSEMBLY (410010 CARD)
 - 3.1 12 Volt Regulator
 - 3.2 -12 Volt Regulator
 - 3.3 Overcurrent Protection
 - 3.4 Overvoltage Protection
4. 5 VOLT REGULATOR ASSEMBLY (410012 CARD)
 - 4.1 5 Volt Regulator
 - 4.2 Overcurrent Protection
 - 4.3 Overvoltage Protection
 - 4.4 Thermal Protection
5. GROUNDING IN THE 40PSU102 AND 40PSU103
6. NOISE

SHEET

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CIRCUIT DESCRIPTION FOR
THE 40PSU102 AND 40PSU103 POWER SUPPLIES

SECTION I - GENERAL TECHNICAL DATA

1. PURPOSE AND OPERATION

1.1 The 40PSU102 and 40PSU103 are designed to satisfy the requirements of the 40C400. This supply generates three regulated output voltages (+5V @ 25A, +12V @ 4A and -12V @ 4A) and a logic level Power on Reset (POR) Signal.

1.2 The supplies are designed to meet requirements set forth in Specification 62,131S. A partial summary of these requirements follows:

General

Max. Power Out 221 Watts

5 Volt Supply

Max. Current 25 Amps

V_{out} Tolerance *
(at external sense point) $\pm 5\%$

12 Volt Supply

Max. Current 4 Amps

V_{out} Tolerance *
(at output terminal) $\pm 5\%$

-12 Volt Supply

Max. Current 4 Amps

V_{out} Tolerance *
(at output terminal) $\pm 5\%$

*Tolerance includes: set point deviation, line regulation, load regulation, noise, ripple and temperature drift.

1.3 Electronics for the supply is partitioned into three separate circuit cards: the 410010 AC-DC Card Assembly, the 410011 12 Volt Regulator Assembly and the 410012 5 Volt Regulator Assembly.

1.3.1 410010 AC-DC Card Assembly

The AC-DC Card Assembly contains: 3 AC-DC converters (+24V, +48V and -48V), the auxiliary IC Supply voltages (+V_R & -V_R), Power on Reset circuitry, fuse protection for the converter outputs and output interconnect hardware for the 40PSU102. A more detailed description of the 410010 Card function appears in Section III.

1.3.2 410011 12 Volt Card Assembly

As its name implies, the 12 Volt Card Assembly essentially contains the control and protection circuitry for the +12 volt regulators. Further description appears in Section III.

1.3.3 410012 5 Volt Card Assembly

In addition to the control and overvoltage-overcurrent protection circuits, the 5 Volt Card Assembly contains a special thermal shutdown circuit. A more detailed description of the 410012 Card appears in Section III.

1.4 The 40PSU103 power supply is exactly the same as the 40PSU102 supply with the exception of an added power line filter. This filter is required on the input AC leads so that the 40PSU103 can meet the power line conducted requirements of specification 61,265S. There are no other operational differences between the 40PSU102 and 40PSU103 supplies.

2. SUPPORTING INFORMATION

1381SD - Schematic Diagram
62,131S - Specification
9581WD - Wiring Diagram
61,265S - Specification

SECTION II - DETAILED DESCRIPTION AND THEORY OF OPERATION

1. FRONT END DESCRIPTION

1.1 The front end of the 40PSU102 consists of a circuit breaker and a 50-60 Hz., power transformer (T1). The circuit breaker functions as both a protective device against AC-DC converter faults and as a power supply ON-OFF Switch. When tripped, the breaker toggle moves to "OFF" and cannot be manually overridden to re-establish continuity. Transformer T1, which provides line isolation has secondary windings of 24 and 96 volts.

1.2 The front end of the 40PSU103 is the same as above with the addition of a power line filter between the circuit breaker and the power transformer.

2. AC-DC CARD ASSEMBLY

The supplies have three AC-DC converters generating outputs of 24V, 48V and -48 Volts. Bridge CR101, mounted on the 5 volt heat sink, full wave rectifies the 24 volt winding of T1. Current through CR101 charges energy storage elements C1 and C2. R1 is the converter bleeder resistor. Transient protector TP2 protects CR101 against line and transformer induced transients.

The +48 volt converters are generated off the 96 volt winding of T1. Again, the winding is full wave rectified (here by a discrete component bridge) and current through the bridge charges energy storage elements C3, C4, C5 and C6. The unregulated 48 volt output is developed across C3 and C4, while the -48 volt output is developed across C5 and C6. R2 and R3 serve as bleeder resistors. As on the 24 volt bridge, a transient protector (TP1) is employed across the bridge.

2.2 Converter Fusing

Long term current overload protection for the converters is provided in the form of fuses. The +24, +48 and -48 volt converters are fused at 20A, 5A and 5A respectively.

2.3 Auxiliary Supply Voltages

Two auxiliary supply voltages are developed on the AC-DC Card for use by various IC's in the supply. The positive aux voltage, designated as +V_R is designed to supply 12V $\pm 10\%$ at a maximum load of 100 ma. ML1, a self-contained three terminal regulator accomplishes this task. The negative aux voltage designated as -V_R is designed to supply -15V $\pm 5\%$ at 50 ma. A simple series resistor - zener (CR7, R5 and R4) combination generates this supply. Both +V_R and -V_R are distributed to the +5 volt card and +12 volt card. It should be noted that the aux supplies, as internal voltages, do not carry overvoltage and overcurrent protection.

2.4 Power-On-Reset Signal

The AC-DC Card Assembly provides the Power-On-Reset Signal for the 40C400. Power-On-Reset is a timed low level (max. vol = 0.4V @ $I_C = 100$ ma) signal, generated on system start-up. It is used to force the start of a system initialize routine in the I_{XL}. The POR signal is timed off the +12 supply voltage and generates a minimum 50 ms pulse. R6 and C11 are timing components used in conjunction with ML2 to generate this pulse. Q1, the POR output transistor is an open collector device and is pulled up to 5V via a 280 ohm resistor located on the IXL card.

The POR signal, as designed, for the supplies, does not detect out of regulation condition on the supply outputs and is not guaranteed "bounceless" on start-up.

Later power supplies have incorporated a circuit which will initiate a POR signal if the input AC voltage falls below approximately 98VAC. After input rises above the 98VAC level, a 50m Sec. time out will occur.

2.5 "Run Lights"

A "Run Light" is provided on the AC-DC Card for each of the power supply output voltages. A "lit" LED (CR4, CR5 or CR6) indicates that an output voltage of greater than approximately 2.0V is present on that supply.

2.6 Output Connector

The various supply outputs - (+5V, +12V, -12V) are routed to the AC-DC Card for interconnect to the C400 System. On the output connector strip, 2 terminals are allocated to the 5 volt output, 2 to system ground, 1 to the 12 volt output, 1 to the -12 volt output, 1 to POR, 1 to +5V standby, 1 to +12V standby and 1 to -12V standby. The twelfth terminal is reserved as a charging lead (+24V unregulated) for future systems equipped with a standby memory power system.

The C400 buses power to memory independent of other system power. Memory power is distributed on the output leads designated as standby. In future standby power equipped systems, these leads will be driven from the battery-back up system.

3. 12 VOLT REGULATOR ASSEMBLY (410010 CARD)

3.1 12 Volt Regulator

The +12 volt supplies are controlled by switching regulators utilizing pulse width modulation. A PWM switcher can be characterized by the following components: a high current switch (Q1), a fast recovery diode (located with the power Darlington in Q1), a low pass L-C filter (L1, C5), a stable reference voltage (2.0V $\pm 1\%$; TC .005%/°C located in ML1), an error amplifier (located in ML1) and finally the pulse width modulator itself (also located in ML1).

3.1 (Continued)

As its name implies, a PWM switching regulator controls an output voltage by passing current to an output filter and load for varying portions of a fixed period of time. With a constant load, the pulse width assumes some steady state value determined by input voltage, output voltage and modulator frequency.

A dynamic increase in load causes more load current to be pulled from the output filter capacitor (C5), thus decreasing output terminal voltage. As output voltage decreases, the error voltage feeding the error amp in ML1 increases the pulse width output of ML1 (Pin 25) driving Q1, the Darlington switch, "ON" for a longer period of time; Q3 and Q2 are concurrently driven off for a longer period of time. When Q1 is "ON", current through the switch linearly increases at a rate directly proportional to $V_{in} - V_{out}$ and inversely proportional to L1. The actual peak current for a given cycle is determined by: the recovery diode current when the switch turns "ON", the increase rate of I_{switch} , and the pulse width duration. The maximum duty cycle of ML1 is approximately 50%, corresponding to a pulse width of 25 μ s, the minimum pulse width is approximately 2%, corresponding to a pulse width of approximately 1 μ s. When I_{switch} starts decreasing, inductor L1, which attempts to maintain an uninterrupted current flow, swings negative (V_L that is) turning on the fast recovery diode in Q1. During this phase of the cycle, energy from the collapsing field of L1 supplies a decreasing current to the load. This decreasing current rate is directly related to the output terminal voltage and inversely related to L1. The actual current decrease for a cycle is a function of this rate and the "OFF" time of switch Q1. Since for a dynamic increase in load "ON" time increases and "OFF" time decreases, the average output current increases. Increasing average output current: increases output terminal voltage, decreases V_{error} (the differential error amp voltage in ML1, Pin 15 to Pin 16) and eventually returns the ML1 output pulse width to its steady state value.

The converse of this description is true for a dynamic decrease in load. The three regulators in the supplies essentially operate on this same principle.

ML1 used in the +12V supply is a specialized hybrid regulator containing an op-amp, pulse width modulator, 1% 2.0V reference and two modes of shutdown circuitry. R12 and C6 provide roll-off compensation for the internal op-amp, R28 is part of the precision feedback divider and R10 is the gain control resistor. In addition 240 ma of output preload is provided on the +12 supply by R31; this prevents the terminal voltage from rising excessively under no load conditions.

3.2 -12 Volt Regulator

The -12 volt regulator differs from the other supplies in the manner in which it generates its reference voltage. References for the positive voltage supplies are absolute at 2.0V (pin 8 of the pulse width modulator, IC) with respect to ground; reference for the -12V regulator is again 2.0V, but with respect to the -12 volt output. This "floating reference" alleviates the need for a precision, temperature stable negative auxiliary voltage. Voltage

3.2 (Continued)

across ML2 is constrained to 13V by R13 and CR1. In normal operation ($V_{out} = -12V$), pin 14 (V_{CC}) of ML2 will be at approximately 1V, pin 1 (GND) at -12V, and pin 8 (V_{ref}) at -10V. During initial start and under short circuit conditions the voltages across ML2 are $+V_R$ and ground. Roll-off compensation for the Pulse Width Modulator op-amp is provided by R29 and C10. R23 the op-amp gain control, effects transient response and hence the level of output ripple. R25 and R33 constitutes the output voltage feedback divider. Preloading is also provided on the -12V supply; R32 furnishes 100 ma of preload.

3.3 Overcurrent Protection

A shutdown form of overcurrent protection is provided on the $\pm 12V$ supplies. Protection is afforded against both load faults and overcurrent condition on start-up. Sense resistors R6 and R18 will pass about 6.5A @ 25°C before turning on their respective shutdown transistors. When a logic high (2.0V V 4.0V) is applied to pin 26 of the pulse width modulator, the output transistor is forced to its off state.

Transistors Q3, Q2, Q8 and Q7 are biased "ON" with the PWM "OFF"; consequently, Darlington switches Q1 and Q6 are held "OFF" whenever the PWM is "OFF". This form of protection exhibits an Output Characteristic similar to that of a current limit circuit.

3.4 Overvoltage Protection

Load protection against supply overvoltage is furnished by CR3 and CR5. These devices are high energy (3 joule) diodes which exhibit zener diode characters. On occurrence of an overvoltage fault, output terminal voltage rises to approximately $\pm 17V$ where it is clamped until the respective AC-DC converter fuse opens (about 10 ms).

4. 5 VOLT REGULATOR ASSEMBLY (410012 CARD)

4.1 5 Volt Regulator

The 5 volt regulator again uses a PWM and except for components is almost identical in operation to the ± 12 volt regulator. Q1 is the high current switch and Q2 the driver. With the output of the PWM (ML1 pin 25) high, Q4 is biased "ON" forcing Q3 "ON", Q2 "OFF" and ultimately switch Q1 "OFF". CR1 is the fast recovery diode, L1 and C8 form the low pass output filter. R4 is the overcurrent sense resistor and CR2 is the reverse voltage protection diode. To improve turn-off time of Q1 and hence to reduce its power dissipation, a second inductor (L2) is used to "sweep out" excess base charge. CR6 and CR7 protect Q1 against possible gain degradation due to repeated avalanche mode operation. Diode CR3 guards against accidental crowbar firing when the 5V sense is inadvertently left open.

4.2 Overcurrent Protection

The +5 supply employs a foldback form of overcurrent protection. Circuit components are R4, R5, R6, R7, C4, C7, Q5 and ML2. Under no load conditions the output of ML2 (pin 6) is approximately equal to the output terminal voltage of the supply. As load is increased V_6 linearly decreases. At I_{load} approximately 27 amps, Q5 turns "ON" and begins to discharge C7. Since Q5 and C7 shunt V_{ref} , the reference voltage is pulled towards ground. Decreasing V_{ref} makes V_{out} appear high, forcing the PWM to reduce pulse width. V_{out} and I_{switch} are subsequently reduced providing foldback. The foldback set point is a function of: output terminal voltage, ripple magnitude, ML2 gain, V_{BE} (Q5) cut in, V_{ref} and finally temperature. C7 is the predominant influence on full load start-up, foldback hysteresis and foldback response time.

4.3 Overvoltage Protection

A crowbar circuit serves as the load overvoltage protection on the 5V supply. The crowbar circuit consists of ML3, R15, R18, R19, R20, R21, CR4, C5 and Q8. ML3 functions as a comparator in the gate firing circuit of Q8. It should be carefully noted that the I^2t rating of Q8 is again "tuned" to the fast blow characteristics of the 20A fuse on the 410010 Card. Substitution of a slower blow or a higher current fuse will result in damage to Q8.

4.4 Thermal Protection

A normally open sensor in the +5 volt heat sink monitors heat sink temperature. If heat sink temperature should exceed 110°C, Q4 is shorted forcing the 5 volt supply "OFF".

5. GROUNDING IN THE 40PSU102 AND 40PSU103

5.1 Because of high di/dt paths, switching supplies are prone to ground and noise problems. The supplies maintain a single frame ground at the output terminal strip (410010 Card), thus enabling a good system reference. High di/dt ground and control grounds are separated to minimize noise problems.

6. NOISE

6.1 To meet the maximum output noise limits required by Specification 62,131S cable routing as shown by card assembly drawings and Specification 62,131S MUST BE MAINTAINED. 200 to 400 mv deviations in noise level may be observed if haphazard routing is employed.