

SHEET INDEX					DWG RATING RMVD. NOTE 6.64, FIG 6K, PAR8, SH1A, 43 & 45 ADDED, SH 41 RNBD TO SH 44. TRADEMARK BELLPAC CHG TO FASTECH. PT ISS 2.1 THRU 2.9 APPLIED TO DWG. IN FIG 4 MIN EXPOSED PIN LG BEYOND RETAINER WAS .225 & REF NOTE 9 ADDED. ON SH 27 & 28 TBL 1 REF TO TEFZEL WIRE PER KS21471 & NOTE 2 RMVD. NOTE 6.111 RMVD. IN FIG 6B DIM & NOTE 5 RMVD. FIG 6I RNBD FROM DUPL FIG 6H. IN FIG 6I & 6J NOTE 2 TORQUE WAS 4 1/2 INCH LBS.					PER LDI 1 A.T.&T.CO.CLA 2-16-79 WE.CO.CLA				
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AT&T - PROPRIETARY														ISSUE
THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF AT&T AND IS NOT TO BE DISCLOSED OR USED EXCEPT IN ACCORDANCE WITH APPLICABLE CONTRACTS OR AGREEMENTS														5
COMMON SYSTEMS ELECTRONIC SWITCHING TYPE FASTECH* TECHNOLOGY WIRING AND CABLING INFORMATION														
*TRADEMARK OF AT&T														
AT&T TECHNOLOGIES											DWG SIZE 1S			ED-4C251-10 50 SHEETS, SHEET 1

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1. GENERAL WIRING AND CABLING REQUIREMENTS.

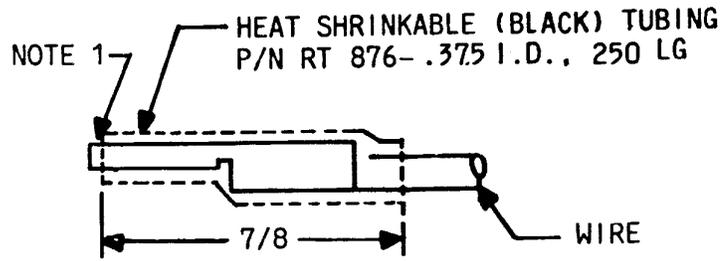
- 1.1 WIRING AND CABLING SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS IN THE BSP 800 DIVISION, 612 LAYER, EXCEPT AS SPECIFICALLY OTHERWISE STATED. THE PARAMETERS AFFECTING THE DESIGN OF TERMINALS TO BE USED FOR SOLDERLESS-WRAPPED CONNECTIONS ARE DESCRIBED IN SPECIFICATION X-17151. THE INFORMATION CONTAINED HEREIN SUPPLEMENTS THE REQUIREMENTS OF THE AFORMENTIONED DOCUMENTS.
- 1.2 BOTH 28 AND 30 GAUGE, SILVER PLATED, CADMIUM-CHROMIUM-COPPER WIRE (ALLOY 135) CAN BE SOLDERLESS-WRAPPED USING A HAND GUN ON EITHER .025" SQUARE OR .020" X .030" TERMINALS OF COPPER-NICKEL (80-20) OR COPPER-NICKEL-TIN (89-9-2) MATERIALS. FURTHERMORE, 30 GAUGE (ALLOY 135) MAY BE USED ON ALL TERMINALS PRESENTLY APPROVED FOR 26 GAUGE WIRE WHEN APPLIED WITH A SPECIAL WIRE-WRAPPING BIT. THE TURNS REQUIREMENT FOR BOTH 28 AND 30 GAUGE CONNECTIONS IS A MINIMUM OF SIX TURNS OF BARE WIRE PLUS 3/4 TO 1-1/2 TURNS OF INSULATED WIRE (MODIFIED WRAP). MINIMUM STRIP-OFF FORCE FOR 30 GAUGE WIRE CONNECTIONS IS 14.7 NEWTONS (1500 GRAMS) AND FOR 28 GAUGE WIRE CONNECTIONS IS 21.56 NEWTONS (2200 GRAMS).
- 1.3 MACHINE WRAPPED WIRE CONNECTIONS (SUCH AS THE GARDNER-DENVER, FULLY AUTOMATIC) ARE ALSO APPROVED USING 30 GAUGE WIRE (ALLOY 135) ON THE .025" SQUARE AND .020" X .030" TERMINALS. THE TURNS AND STRIP-OFF FORCE REQUIREMENTS ARE THE SAME AS INDICATED IN 1.2.
- 1.4 BOTH 28 AND 30 GAUGE OFHC (OXYGEN FREE, HIGH CONDUCTIVITY) TINNED COPPER WIRE ARE APPROVED FOR SOLDERLESS-WRAPPED CONNECTIONS PROVIDED THAT:
- (A) CONNECTIONS ARE PRODUCED WITH THE USE OF SEMI-AUTOMATIC (HAND HELD TOOL WITH FLOATING BIT) OR FULLY AUTOMATIC WRAPPING TOOLS.
 - (B) CONNECTIONS CONSIST OF MINIMUM SEVEN (7) TURNS OF BARE WIRE, PLUS 3/4 TO 1-1/2 TURNS OF INSULATED WIRE (MODIFIED WRAP).
 - (C) CONNECTIONS ARE MADE ON .025" X .025" OR .020" X .030" TERMINALS OF EITHER COPPER-NICKEL (80-20) OR COPPER-NICKEL-TIN (89-9-2) MATERIALS.
 - (D) MINIMUM STRIP-OFF FORCE FOR 30 GAUGE WIRE CONNECTIONS IS 14.7 NEWTONS (1500 GRAMS) AND FOR 28 GAUGE WIRE CONNECTIONS IS 21.56 NEWTONS (2200 GRAMS).

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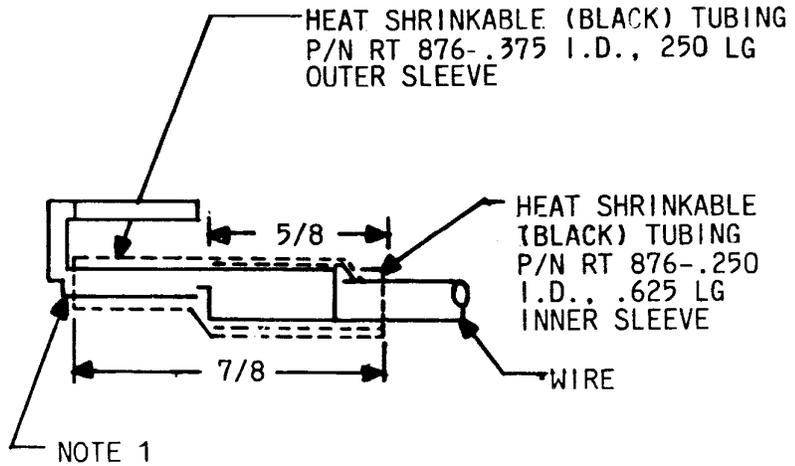
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STRAIGHT PUSH ON
TYPE TERMINAL



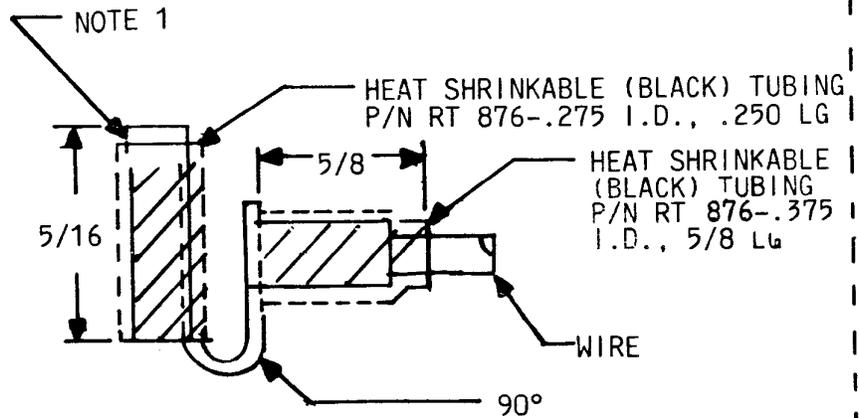
SK-A

RECEPTACLE AND TAB
COMBINATION TYPE
PUSH ON TERMINAL



SK-B

PUSH ON TYPE
TERMINAL LUG



SK-C

FIG. K

TYPICAL HEAT SHRINK SLEEVING FOR PUSH ON TYPE TERMINALS
NOTE 1: AFTER SLEEVING APPLICATION THERE SHALL BE AN
APPROX. 1/16 INCH SPACE BETWEEN THE SLEEVE AND
OPEN LUG END.

1.5 THE USE OF HARD GOLD PLATING (727A) ON .025" X .025" OR .020" X .030" TERMINALS OF EITHER COPPER-NICKEL (80-20) OR COPPER-NICKEL-TIN (89-9-2) MATERIAL IS APPROVED FOR CONNECTIONS WRAPPED WITH OFHC OR ALLOY 135 WIRE. CONDITIONS STATED IN 1.2 OR 1.4(A), (B) & (D) SHALL BE OBSERVED.

1.6 WIRING METHODS ARE DEFINED IN BSP-005-150-101. THE FOLLOWING IS A DEFINITION OF THE D4 WIRING METHOD TO BE INCORPORATED INTO THE BSP.

D4 WIRING RUN LOOSE AND DRESSED NEAR OR AGAINST THE WIRING SURFACE, MOUNTING PLATE OR PANEL AND RUN PARALLEL OR PERPENDICULAR TO THE EDGES OF THE PLATE OR PANEL IN DEFINITE PATHS. THIS TYPE OF SURFACE WIRING DIFFERS FROM SW1 OR D3 SURFACE WIRING IN THAT THE COLOR, GAUGE, TYPE OF WIRE, AND WIRE PATHS ARE TO BE SPECIFIED IN THE FORM OF PROGRAM DOCUMENTATION FOR AUTOMATIC WIRING AND WIRE PATH RULES FOR MANUAL REPAIRS AND CHANGES.



2. SPECIFIC WIRING AND CABLING REQUIREMENTS.

2.1 SPECIFIC REQUIREMENTS FOR WIRING AND CABLING ARE COVERED IN BSP 800-612-150 AND THE FOLLOWING SUPPLEMENTARY INFORMATION.

2.2 TWISTED LEADS:

2.21 WHERE THE 4 TO 5 TWISTS PER INCH OF 30 GAUGE PAIRED WIRE IS SPECIFIED, THE FIRST TWIST SHALL START WITHIN 1/2" FROM THE CONTROL TERMINAL (SEE FIG. 1).

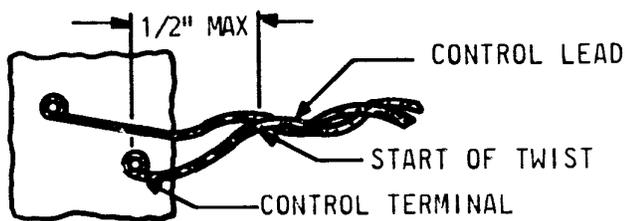


FIG.1

4 TO 5 TWISTS PER INCH PAIRED WIRE CONNECTING TO TERMINALS.



2.36 MANUAL CHANGES AND REPAIRS FOR D4 WIRING SHALL BE MADE USING THE FOLLOWING FIGURES. THE APPROPRIATE WIRING DOCUMENT WILL CONTAIN THE REFERENCE TO THE FOLLOWING FIGURES:

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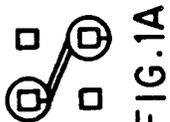


FIG. 1A



FIG. 1B

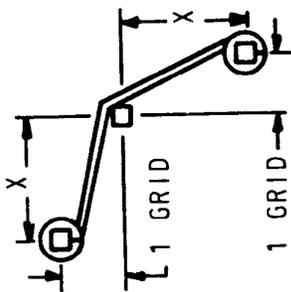


FIG. 2A

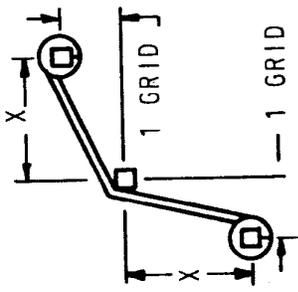


FIG. 2B

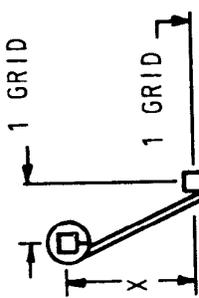


FIG. 2C

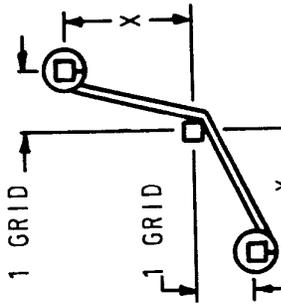


FIG. 2D

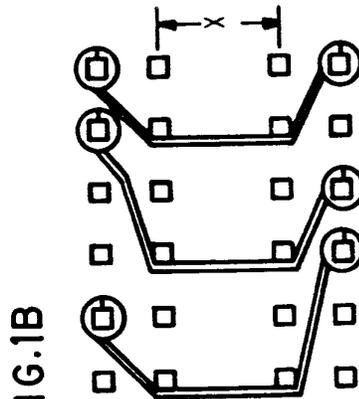


FIG. 4A

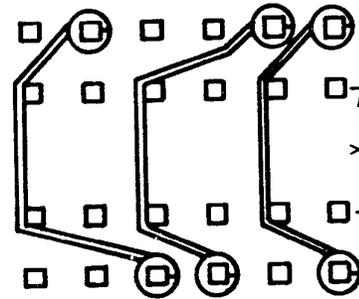


FIG. 4B

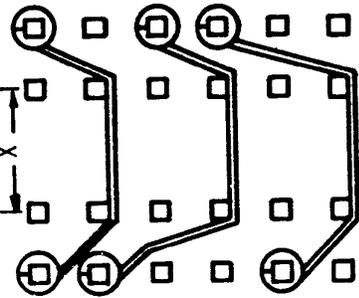


FIG. 4C

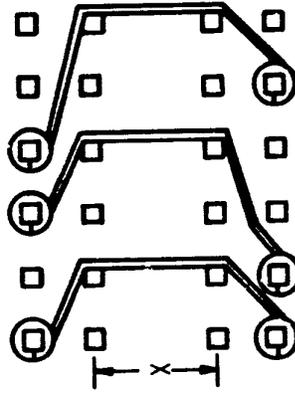


FIG. 4D

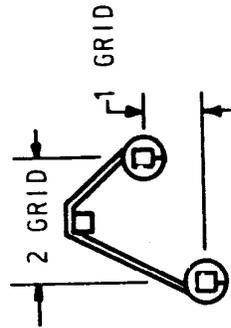


FIG. 7A

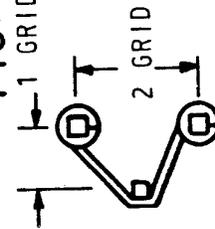


FIG. 7B

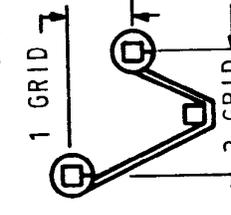


FIG. 7C

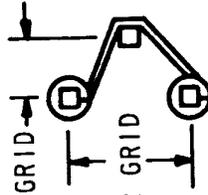
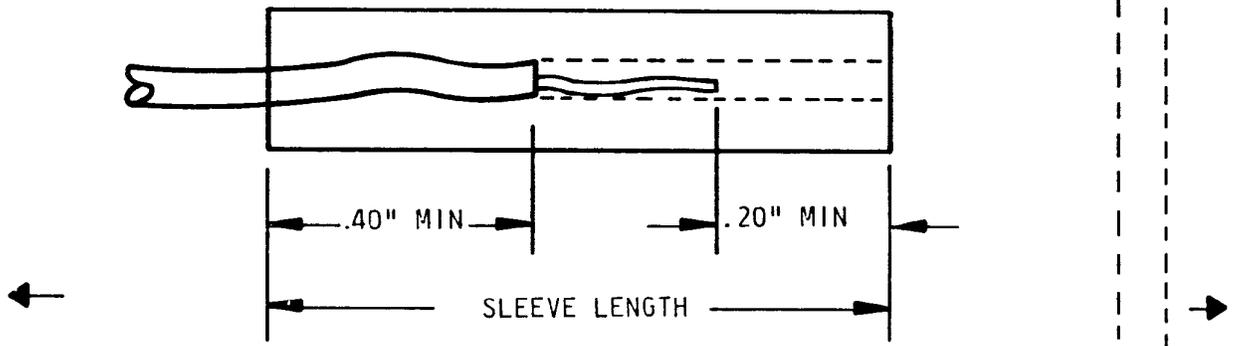


FIG. 7D

1 GRID = 0.125 INCH.
X = ANY DISTANCE
GREATER THAN
1 GRID.



- 2.36.1 AN ALTERNATE TO WIRE REMOVAL, IN BACKPLANE SURFACE WIRE REPAIR, IS TO SLEEVE THE WIRES AND LEAVE THEM IN PLACE. WHEN IN THE JUDGEMENT OF CRAFTS PERSONNEL, DEFECTIVE BACKPLANE WIRES ARE DIFFICULT TO REMOVE, SUCH THAT REMOVAL COULD CAUSE DAMAGE TO OTHER WIRES, THEY SHALL HAVE THEIR ENDS SLEEVED AND BE LEFT IN THE BACKPLANE, AFTER DISCONNECTION.



APPROVED SLEEVING FOR THE KS-21336 AND KS-21471 30 GA WIRE IS: INSULATION SYSTEMS INC., SUNNYVALE, CA, "NO HEAT SHRINK", CLEAR, .015" RECOVERED ID, 80 DURO, .020" ± .003 WALL THICKNESS, PVC TUBING. (INSULATION SYS PART NO. IS: EMG 0015 - 020C 2500CC - 250 PCS, 2" LONG IN RESEALABLE TEAR TOP CAN).

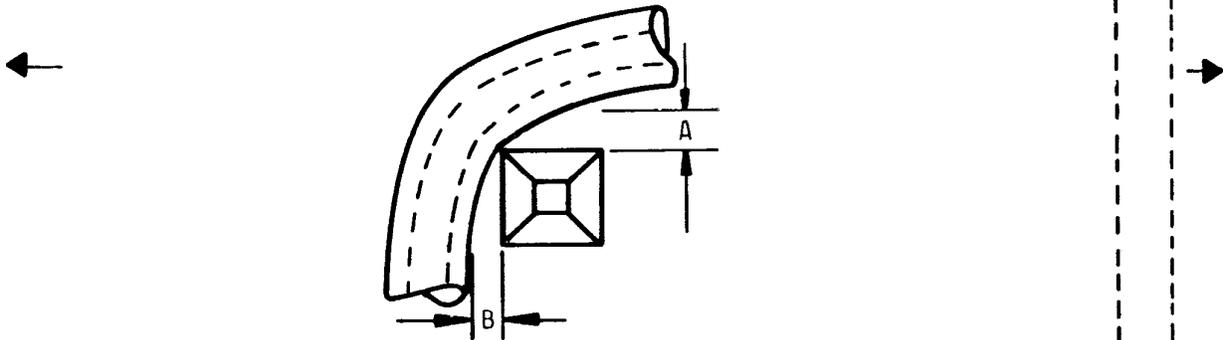
- 2.37 THERE SHALL BE NO MORE THAN 1/2" SLACK IN ANY WIRE RUN.
- 2.38 IN ADDITION TO THE REQUIREMENT OF BSP 800-612-150, THAT WIRES SHALL NOT BE DRAWN TAUT AROUND THE TERMINALS, THE FOLLOWING REQUIREMENTS MUST BE MET FOR WIRE WITH A MINIMUM OF .0045 INCHES OF INSULATION:

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- A. THERE SHALL BE NO DEFORMATION OF THE WIRE INSULATION AT THE POINT OF CONTACT. DEFORMATION IS DEFINED AS A DEFINITE INDENTATION OR CUT (NICK) CAUSED BY THE TERMINAL CORNER. IT DOES NOT INCLUDE THE SLIGHT REDUCTION OF DIAMETER CREATED BY BENDING, NOR THE WRINKLING OF THE WRAPPED TAPE INSULATION (MILENE).
- B. $(A + B)$ MUST BE GREATER THAN .028 INCHES. IF $(A + B)$ IS LESS THAN .028 INCHES, THE WIRE IS TAUT AND MUST BE REPLACED, OR PROTECTED BY SLEEVING THE TERMINALS. SEE ILLUSTRATION:



THE $(A + B)$ MEASUREMENT MUST BE USED TO DETERMINE WIRE DEFORMATION FOR SINGLE WIRES WHERE BOTH A AND B DIMENSIONS ARE MEASURABLE.

- C. WIRES FOR WHICH EITHER THE A OR B CANNOT BE MEASURED OR THE A OR B LEG IS TERMINATED .375 INCHES OR LESS FROM THE TERMINAL, AND ALL



PAIRED WIRES, MAY BE EVALUATED AS FOLLOWS BY A QUALIFIED INSPECTOR OR CHECKER:

1. IF THE POINT OF CONTACT BETWEEN THE WIRE AND THE TERMINAL IS ABOVE THE Z1 LEVEL (AWAY FROM THE PANEL), EXERT A SLIGHT FORCE AGAINST THE TERMINAL IN THE DIRECTION AWAY FROM THE WIRE, USING AN ORANGE STICK (KS-6320). IF THE WIRE MOVES WITH THE TERMINAL -- ANY MOVEMENT, THE WIRE IS TAUT AND IS DEFECTIVE.

2. IF THE POINT OF CONTACT IS AT THE Z1 LEVEL OR BELOW (CLOSE TO THE PANEL) OR IF THE UNIT IS POWERED (ELECTRICALLY LIVE), TENSION SHOULD BE DETERMINED VISUALLY AS FOLLOWS:

IF THE INSULATION IS AGAINST THE TERMINAL AND THERE IS 10 PERCENT OR GREATER DEFORMATION OF THE INSULATION AT THE POINT OF CONTACT, AND THERE IS NO OBVIOUS SLACK IN THE WIRE, THE WIRE IS TAUT AND IS DEFECTIVE.

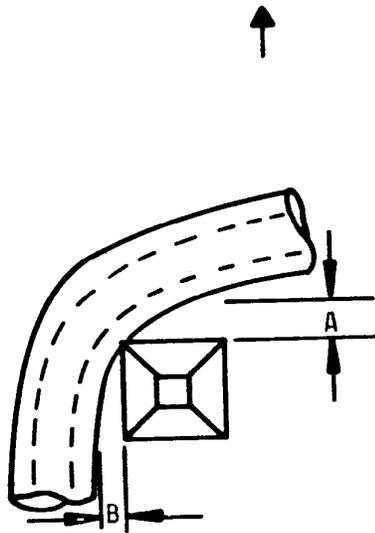
2.38.1 SUPPLEMENTARY INFORMATION REGARDING SEVERITY OF DEFECTS. SE ILLUSTRATIONS:

2.38.2 30 GA WIRE WITH TEFLON INSULATION:
IT IS PERMISSABLE, BUT NOT DESIRABLE, FOR THE INSULATION TO BE DAMAGED TO THE EXTENT THAT THE CONDUCTOR IS EXPOSED, BUT THE EXPOSED CONDUCTOR HAS TO BE .063 FROM THE TERMINATION OF THE WIRE.

2.38.3 30 GA WIRE WITH MILNE INSULATION:
IT IS PERMISSABLE, BUT NOT DESIRABLE, FOR THE INSULATION TO BE DAMAGED TO THE EXTENT THAT THE CONDUCTOR IS EXPOSED ONLY WITHIN THE BODY OF THE WRAP.
THE BODY OF THE WRAP IS DEFINED AS THAT PORTION OF THE WRAP THAT EXISTS BETWEEN THE SHINER AND UP TO THE LAST CORNER OF THE TERMINAL THAT THE INSULATION TOUCHES.
FROM THE BODY OF THE WRAP, AS DEFINED ABOVE, THE INSULATION MAY BE DAMAGED BUT THE CONDUCTOR CANNOT BE EXPOSED TO THE .063 FROM THE TERMINATION OF THE WIRE.

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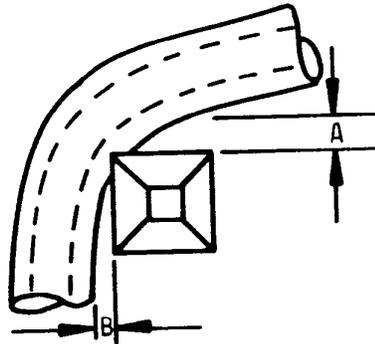


$$.020" \leq A + B < .028"$$

OR

$$10\% \leq \text{DEFORMATION} < 50\% \\ \text{OF INSULATION}$$

THIS DEFECT MAY POSSIBLY CAUSE AN OPERATING FAILURE OF
THE UNIT IN SERVICE.



$$A + B < .020$$

OR

$$50\% \leq \text{DEFORMATION} < 100\% \\ \text{OF INSULATION}$$

THIS DEFECT WILL PROBABLY CAUSE AN OPERATING FAILURE
OF THE UNIT IN SERVICE.

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THE FOLLOWING APPLIES, REGARDING WIRE DEFORMATIONS:

A WIRE CAN BE DEFORMED AND YET HAVE INSUFFICIENT TENSION TO CAUSE EVENTUAL ELECTRICAL BREAKDOWN BETWEEN THE CONDUCTOR AND THE VIA TERMINAL. WHENEVER (A + B) IS LESS THAN .028 INCHES THE WIRE IS CONSIDERED TO HAVE SUFFICIENT TENSION TO CAUSE BREAKDOWN. IF A WIRE HAS AT LEAST 10% DEFORMATION AND IT WAS CAUSED BY DRESSING THE WIRE AGAINST OR DOWN THE TERMINAL IN SUCH A MANNER AS TO CUT OR DEFORM THE INSULATION, IT IS POSSIBLE THAT INSUFFICIENT TENSION EXISTS BETWEEN THE WIRE AND THE TERMINAL TO CAUSE ELECTRICAL BREAKDOWN. THIS CAN BE VERIFIED BY MEASURING (A + B). IF (A + B) IS GREATER THAN OR EQUAL TO .028 INCHES THERE IS INSUFFICIENT TENSION TO CAUSE BREAKDOWN EVEN THOUGH THERE IS GREATER THAN 10% DEFORMATION. MEASURING (A + B) IS THEREFORE SUPERIOR TO MEASURING THE PERCENT OF INSULATION DEFORMATION BECAUSE IT MEASURES TENSION. THUS, THE (A + B) METHOD SHALL SUPERSEDE IN ALL CASES WHERE BOTH CRITERIA INDICATE DIFFERENT DEGREES OF SERIOUSNESS.



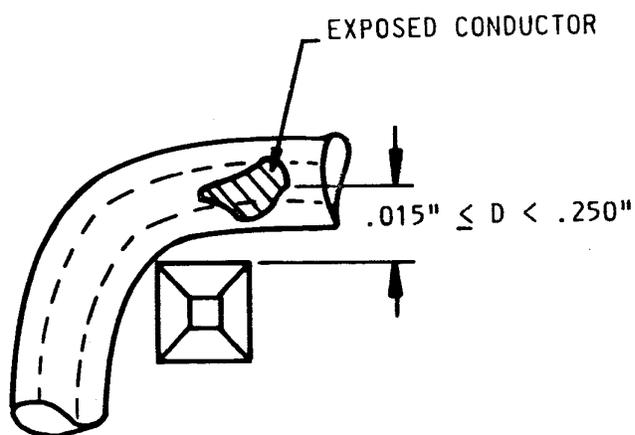
2.39 WIRE THAT HAS BEEN DAMAGED SEVERELY ENOUGH TO CAUSE EXPOSED CONDUCTOR MUST BE REPLACED OR REPAIRED.



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2.39.1 SUPPLEMENTARY INFORMATION REGARDING SEVERITY OF DEFECTS. SEE ILLUSTRATIONS:

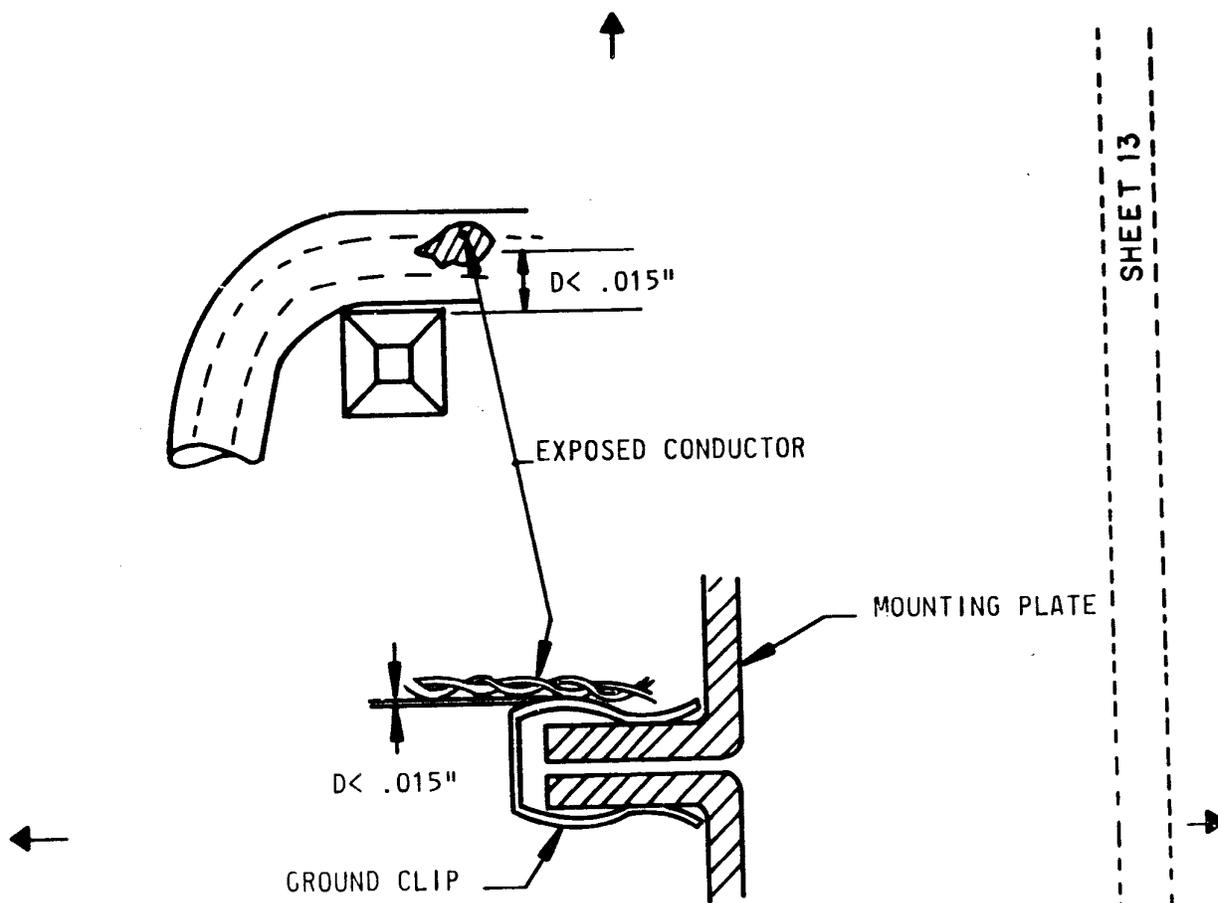


THIS TYPE OF DEFECT MAY POSSIBLY CAUSE AN OPERATING FAILURE OF THE UNIT IN SERVICE.

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THIS TYPE OF DEFECT WILL PROBABLY CAUSE AN OPERATING FAILURE OF THE UNIT IN SERVICE.

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DEFECT CLASSES ARE DEFINED AS FOLLOWS:

- CLASS 2. MAY POSSIBLY CAUSE AN OPERATING FAILURE OF THE UNIT IN SERVICE.
- CLASS 3. WILL PROBABLY CAUSE AN OPERATING FAILURE OF THE UNIT IN SERVICE.
- CLASS 4. A HIGH PROBABILITY OF CAUSING A FAILURE WHICH WILL BE INTERMITTENT OR EXTREMELY DIFFICULT TO DIAGNOSE AND CORRECT.



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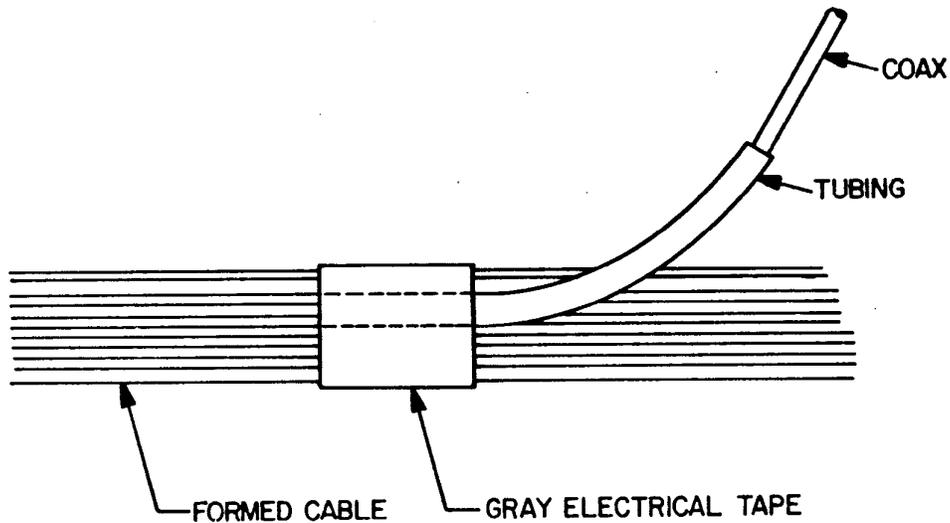


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- 2.4 75 & 100 OHM COAX AND 28 GAUGE SINGLE AND PAIRED WIRE SHIELDED CABLE.
- 2.41 THE ABOVE CABLES MAY BE RUN ON THE MOUNTING PLATE SURFACE, IN FRAME LOOSE WIRE CABLES AND IN FRAME LOCAL CABLES. FORMING, PROTECTING, AND SECURING ARE PER BSP 800-612-153, AND -164.
- 2.42 CABLE ARMS MADE UP OF COAX AND/OR SHIELDED CABLES SHALL BE SECURED TO A CABLE SUPPORT OR RUN IN WIRE GUIDES. WHEN THE CABLE ARM IS SUPPORTED AND SECURED BY USING PLASTIC TY-WRAPS THE CABLE ARM MUST BE PROTECTED BY TAPING UNDER THE TY-WRAP. WHEN THE CABLE ARM IS SECURED TO THE CABLE SUPPORT BY LOOSE TYING WITH TWINE TAPE PROTECTION IS NOT REQUIRED.
- 2.43 MINIMUM BENDING RADIUS FOR 75 AND 100 OHM COAX IS 1/2"
- 2.44 WHERE 75 & 100 OHM COAX AND/OR 28 AWG SINGLE OR PAIRED SHIELDED CONDUCTOR CABLES ARE RUN ALONG THE BACKPLANE SURFACE, THE WIRES SHALL BE DRESSED AS SHOWN IN FIG. 2A.
- 2.45 WHERE 75 & 100 OHM COAX AND/OR 28 AWG SINGLE OR PAIRED SHIELDED CONDUCTOR CABLES ARE IN CABLE ARMS, THE WIRE DRESS TO THE BACKPLANE TERMINAL FIELD SHALL BE AS SHOWN IN FIG. 2B.
- 2.46 75 AND 100 OHM COAX WIRE, WHEN USED FOR LOOSE WIRE SHALL BE LOOSELY SPOT TIED AND NEED NOT BE TAPED; BUT SHALL BE DRESSED INTO THE FRAME OR UNIT CABLE BRACKETS WHEN PROVIDED.

2.47 WHEN COAX CABLES BREAK OUT OF A FORMED CABLE A PIECE OF CLEAR TUBING .118 X 2 INCHES LONG (# 9) NAT VAR TYPE 996537452, OR EQUIVALENT, MUST BE PUSHED ON TO EACH COAX WIRE AT THE POINT OF BREAK OUT FROM THE FORMED CABLE. THE TUBING IS TO BE TAPED FROM THE VERY EDGE WITH GRAY ELECTRICAL TAPE AS SHOWN BELOW.



A MINIMUM OF TWO COMPLETE TURNS OF THE TAPE ARE TO COVER THE TUBING AND THE FORMED CABLE BODY OR ARMS AT THE BREAKOUT.

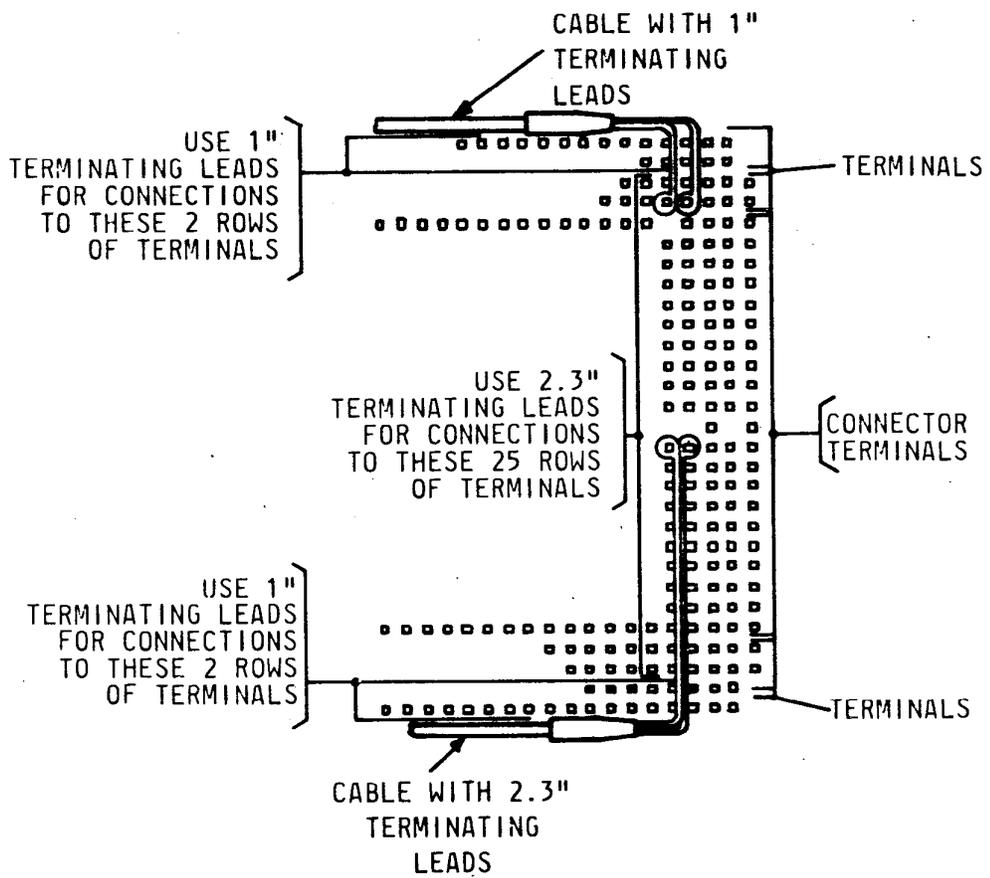
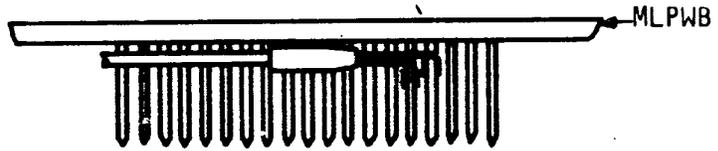


FIG. 2A

TYPICAL COAX OR SHIELDED CABLE DRESS-
CABLES RUN ALONG BACKPLANE SURFACE

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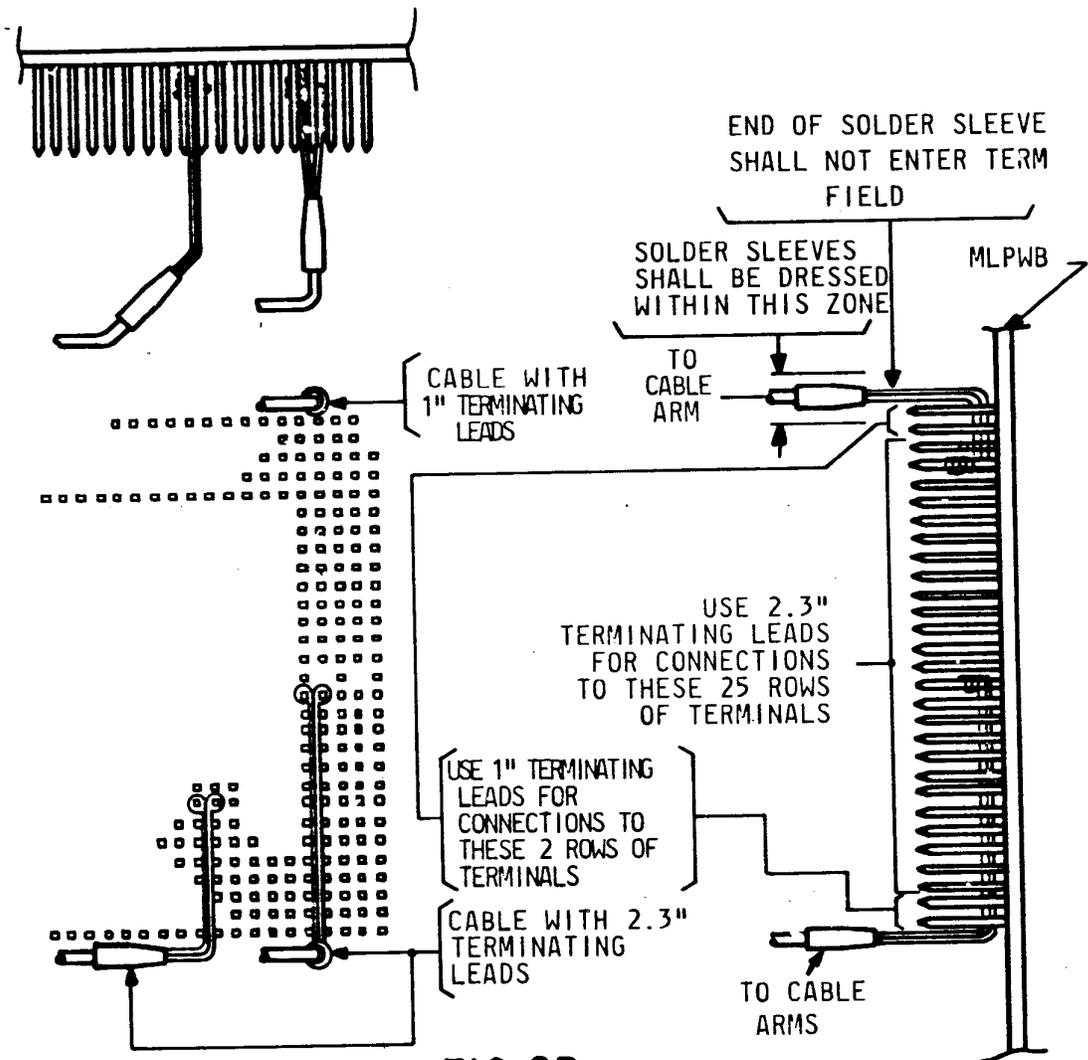


FIG. 2B

TYPICAL COAX OR SHIELDED CABLE DRESS-
FROM CABLE ARM TO BACKPLANE TERMINAL FIELD.

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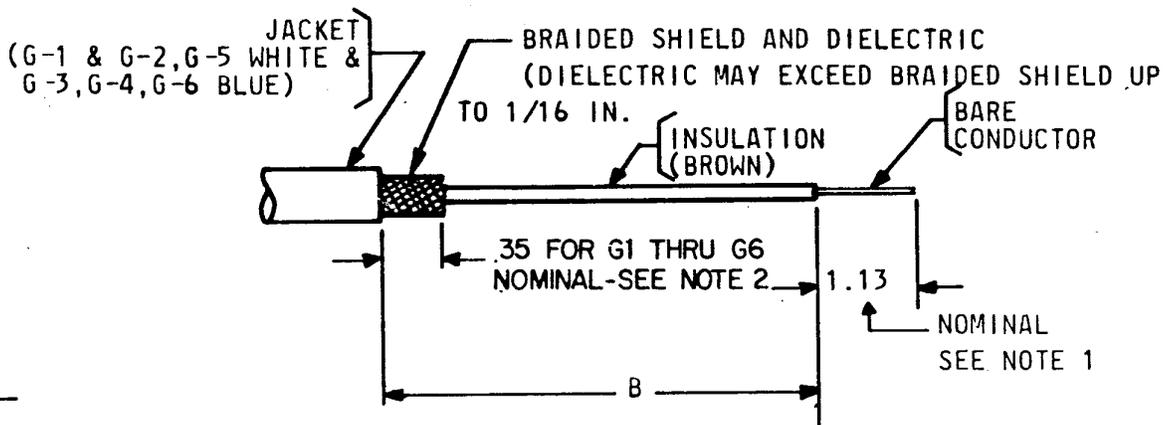
3. CABLE END PREPARATIONS.

3.1 75 AND 100 OHM COAX CABLES AND 28 AWG SHIELDED CA

3.10 CABLE ENDS REQUIRING GROUNDED SHIELDS; THE END OF THE CABLE SHALL BE STRIPPED IN ACCORDANCE WITH THE INFORMATION SHOWN IN FIG. 3A AND 3C. SEE FIG. 3B FOR APPLICATION OF SOLDER SLEEVE TO THE PREPARED CABLE END.

3.11 CABLE ENDS NOT REQUIRING GROUNDED SHIELDS; THE END OF THE CABLE SHALL BE STRIPPED AND THE HEAT SHRINKABLE TUBING APPLIED IN ACCORDANCE WITH THE INFORMATION SHOWN IN FIG. 3D.

3.12 SOLDER SLEEVES AND HEAT SHRINKABLE TUBING SHALL BE FROM RAYCHEM CORPORATION, MENLOW PK., CALIF. OR APPROVED EQUIV.



TERMINATION GROUP	COAX CABLE	DIM* A	DIM B
1	75 OHM	1.00"	1.54
2	75 OHM	2.30	2.84
3	100 OHM	1.00"	1.54
4	100 OHM	2.30	2.84
5**	75 OHM	3.30	3.84
6**	100 OHM	3.30	3.84

* TERMINATING LEAD LENGTHS DETAILED IN FIG. 3B.

** THESE GROUPS SHALL BE USED ONLY ON ONE END OF CABLE.

FIG. 3A

TYPICAL CABLE END PREPARATION - 75 AND 100 OHM COAX KS21112

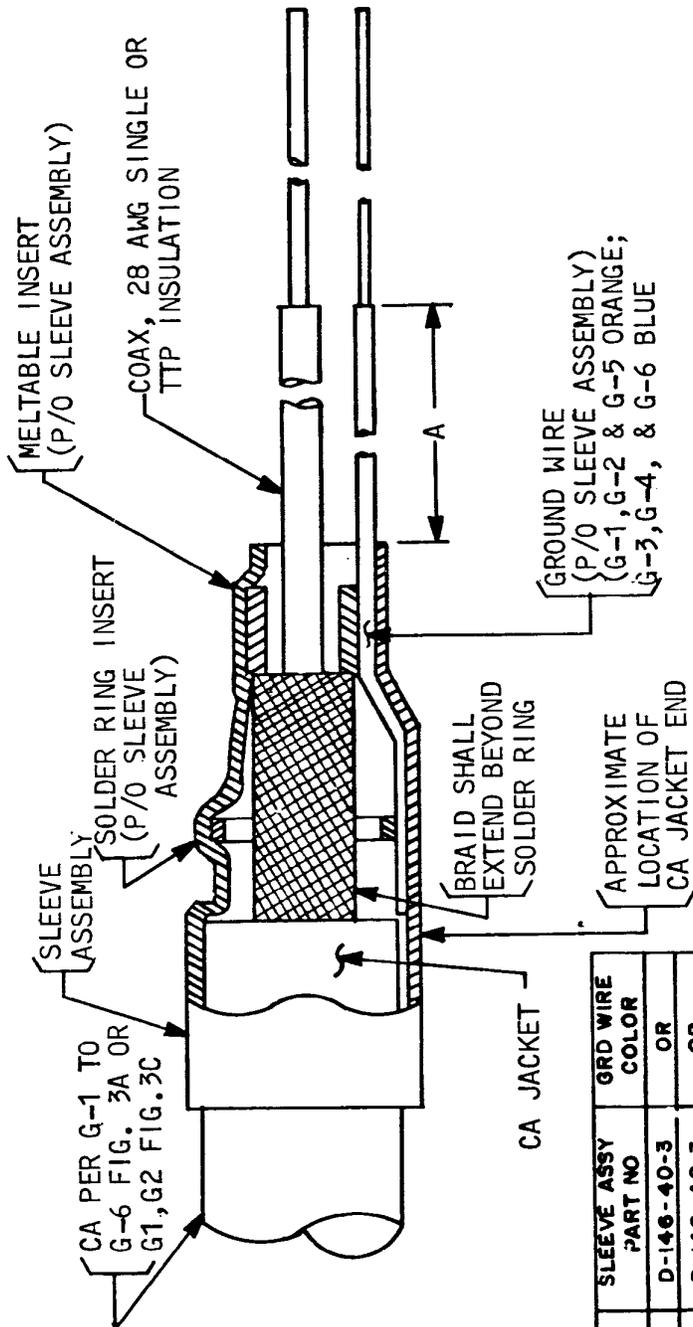
NOTE 1. THE CUTTING LENGTH OF THE COAXIAL CABLE SHALL BE DETERMINED BY ADDING THE CONDUCTOR LENGTH REQUIRED FOR EACH MODIFIED WIRE WRAP CONNECTION TO THE SPECIFIED TERMINAL TO TERMINAL LENGTH.

NOTE 2. DIELECTRIC MAY EXCEED BRAIDED SHIELD, BUT THE BRAIDED SHIELD MUST BE LONG ENOUGH TO INSURE A PROPER SOLDER CONNECTION BETWEEN THE BRAIDED SHIELD AND SOLDER SLEEVE.

NOTE 3. GROUPS 1 & 3 ARE USED FOR CTF PINS AND GROUPS 2 & 4 ARE USED FOR TERMINAL PINS.

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TERM GRP	SLEEVE ASSY PART NO	GRD WIRE COLOR
1	D-146-40-3	OR
2	D-146-40-3	OR
3	D-146-40-6	BL
4	D-146-40-6	BL
5	D-146-40-3	OR
6	D-146-40-6	BL
28 GA SHLD SINGLE	D-146-49	OR
28 GA SHLD PAIRED	D-146-40-3 OR D-146-40-6	OR BL

FIG. 3B

NOTES (SEE NEXT SHEET)

NOTES

1. THE TUBING OF THE SOLDER SLEEVE SHALL BE CLEAR SO AS NOT TO OBSCURE THE SOLDERED CONNECTION.
2. TIME AND TEMPERATURE MUST BE CONTROLLED SO THAT THE PROPER AMOUNT OF HEAT IS APPLIED TO EACH SOLDER TERMINATION TO MEET THE FOLLOWING REQUIREMENTS.
 - A. THERE SHOULD BE EVIDENCE OF GOOD SOLDER WETTING, WITH A FILLET OF SOLDER ALONG SIDES OF WIRE, 50% TOTAL.
 - B. THE SOLDERED CONNECTION ON 30GA WIRE, SHALL BE CAPABLE OF WITHSTANDING A 2LB PULL TEST.
 - C. THERE SHALL BE NO VISIBLE DISCOLORATION OR DISTORTION OF THE INSULATION ON THE CENTER CONDUCTOR OR OF THE OUTER JACKET OF THE SHIELDED WIRE OR CABLE.
 - D. THE SOLDER SLEEVE SHALL COMPLETELY COVER THE TERMINATED CONDUCTORS.
 - E. THE SOLDER SLEEVE SHALL NOT BE SCORCHED, AND SHALL NOT BE DISCOLORED TO SUCH AN EXTENT THAT THE SOLDERED CONNECTION CANNOT BE INSPECTED.

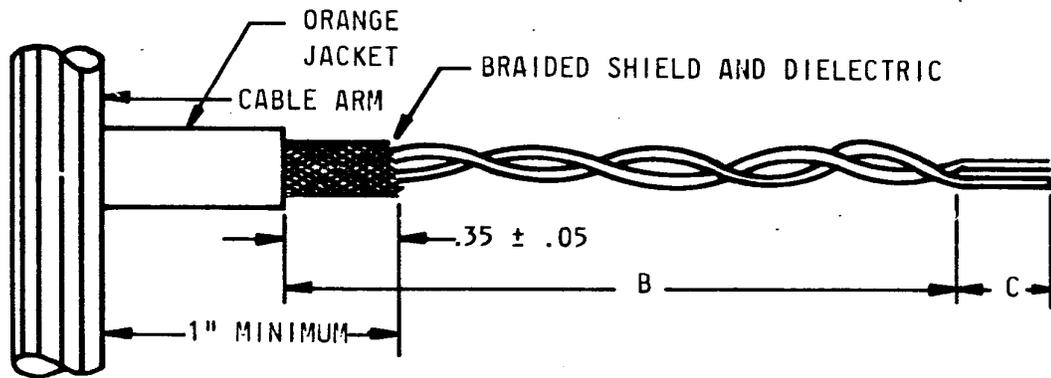


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TERMINATING GRP	DIM A X	DIM B
1: TYP BKPLN CONN TERM. 982 TYPE	1.00	1.54
2: TYP NON-BKPLN CONN TERM.	2.30	2.84

X SEE FIG. 3B

DIMENSION C: 1.13 NOMINAL. SEE NOTE 1 UNDER FIG. 3A

FIG. 3C

FOR KS-21238 SHIELDED WIRE
(SINGLE SHIELDED OR TWISTED SHIELDED)

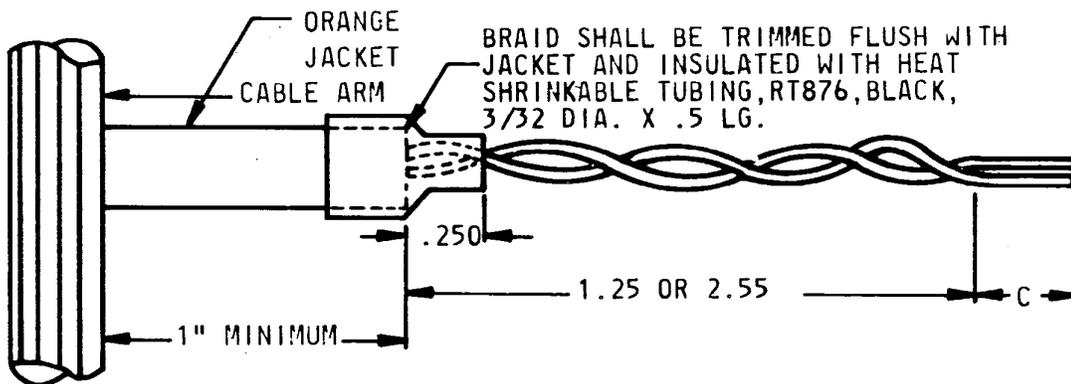
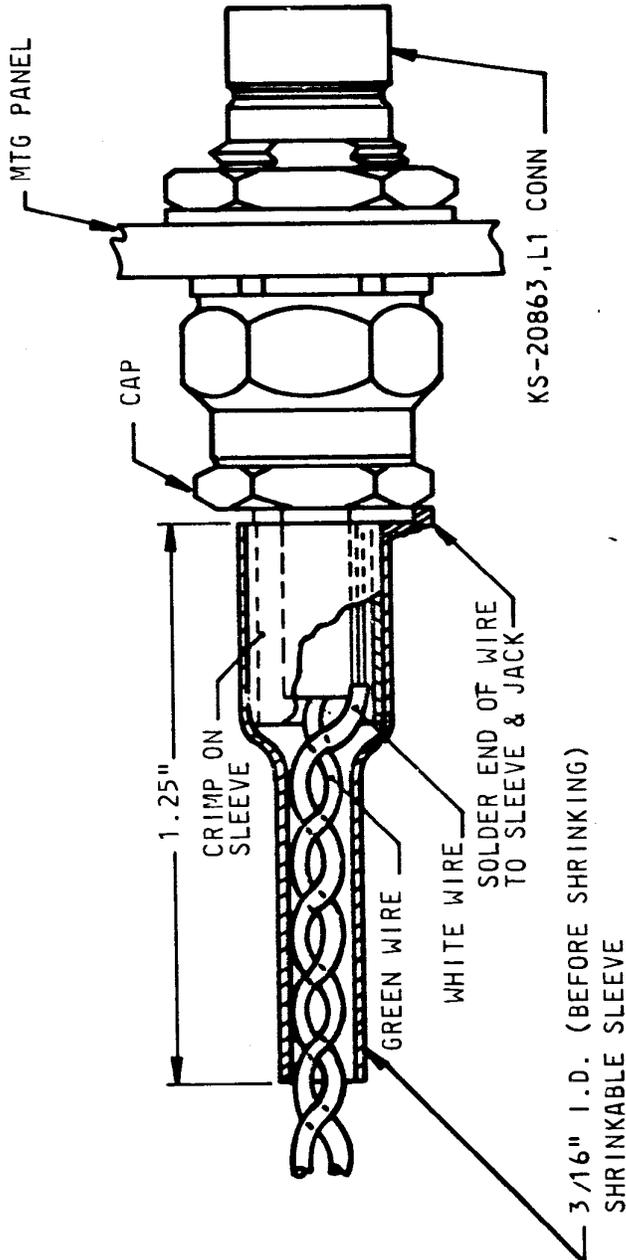


FIG. 3D

FOR KS-21238 SHIELDED WIRE
(SINGLE SHIELDED OR TWISTED SHIELDED)

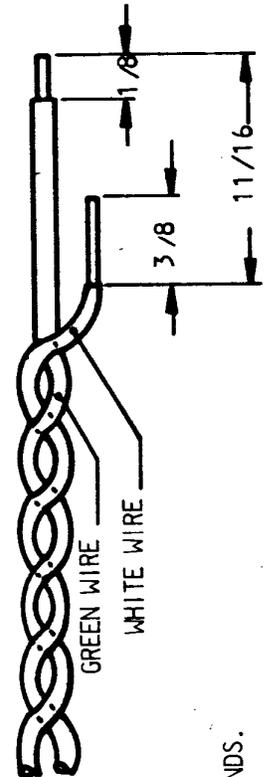
DIMENSION C: 1.13 NOMINAL. SEE NOTE 1 UNDER FIG. 3A.
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METHOD OF TERMINATING TTP INTO COAX CONN

FIG. 5

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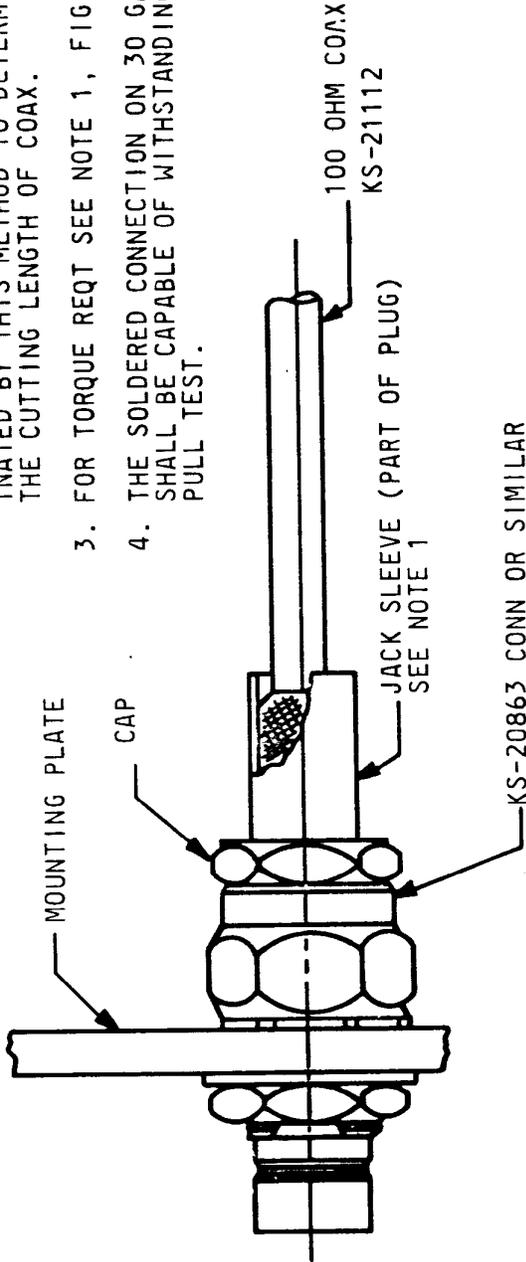


NOTES:

1. A) TORQUE REQ FOR CAP TO BODY OF KS-20863 COAX CONN AND KS-20864 PLUG (NOT DEPICTED) IS 10 INCH POUNDS.
- B) RETAINING NUT WITH COAX CONN, MTD ON METAL PANEL IS 9 INCH POUNDS.
- C) RETAINING NUT WITH COAX CONN, MTD ON NON-METAL PANEL IS 7.5 INCH POUNDS.
- D) THE SOLDERED CONNECTION ON 30 GA WIRE, SHALL BE CAPABLE OF WITHSTANDING A 2LB PULL TEST.

NOTES:

1. PREPARE COAX AS SHOWN AND CRIMP TO JACK SLEEVE AS SHOWN, DO NOT SOLDER COAX TO JACK SLEEVE.
2. ADD 5/8 INCH TO THE DESIRED LENGTH OF COAX FOR EACH END BEING TERMINATED BY THIS METHOD TO DETERMINE THE CUTTING LENGTH OF COAX.
3. FOR TORQUE REQ'T SEE NOTE 1, FIG. 5.
4. THE SOLDERED CONNECTION ON 30 GA WIRE, SHALL BE CAPABLE OF WITHSTANDING A 2LB PULL TEST.



METHOD OF TERMINATING 100 OHM COAX INTO COAX PLUG

METHOD OF TERMINATING TO PLUG

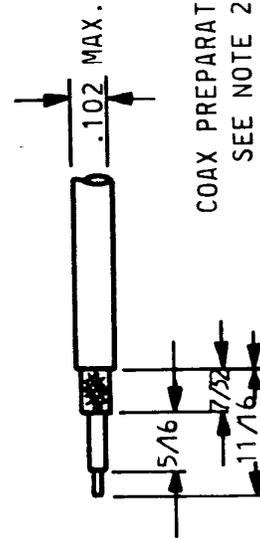


FIG. 5A
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4. BACKPLANE TERMINALS - POSITION OF SOLDERLESS WIRE - WRAP CONNECTIONS.

- 4.1 SOLDERLESS WIRE - WRAP CONNECTIONS USING 30 GAUGE WIRE AND MADE BY AUTOMATIC MACHINE (D4) TO THE .025 SQUARE BACKPLANE TERMINALS SHALL BE POSITIONED WITHIN THE Z1 AND Z2 LEVELS SHOWN IN FIG. 4. THE LEVELS TO WHICH EACH CONNECTION IS MADE ARE CONTROLLED BY PROGRAM.
- 4.2 ON UNITS THAT ARE PARTIALLY AUTOMATICALLY AND MANUALLY WIRED THE MINIMUM START LEVEL FOR MANUAL WIRING (NON D4) SHALL BE Z2 EXCEPT ON A TERMINAL REQUIRING THREE CONNECTIONS (ONE OF WHICH MAY BE A BERG CONNECTOR), THE Z1 LEVEL MUST BY NECESSITY BE THE START LEVEL.
- 4.3 FOR COAX OR TWISTED PAIRS, BOTH WIRES OF ONE END THAT ARE CONNECTED TO ADJACENT TERMINALS MAY BE WIRED TO THE LOWEST COMMON LEVEL AVAILABLE TO BOTH WIRES USING THE SAME CONSTRAINTS AS ABOVE PARAGRAPH 4.2.
- 4.4 THE MINIMUM START LEVEL FOR THE FIRST CONNECTION MADE BY EITHER AUTOMATIC MACHINES OR HAND-HELD TOOLS MAY OVERLAP INTO THE SOLDER FILLET AREA AS SHOWN IN FIG. 4 IN ORDER TO MAINTAIN WIRES WITHIN THE Z1 LEVEL.

← 5. WIRE INSULATION COLOR

- 5.1 THE INSULATION COLORS FOR THE 28 AND 30 GAUGE SINGLE CONDUCTOR WIRES AND THE 30 GAUGE TWISTED PAIR SHALL BE THE SAME AS THE COLORS LISTED FOR THE "BU" WIRE IN BSP 800-612-161. THE GENERAL USE OF COLORS IN THE WIRING AND CABLING OF EQUIPMENT AS COVERED IN THE ABOVE BSP SHALL ALSO APPLY TO THE 28 AND 30 GAUGE KS-CODED WIRES LISTED IN TABLE 1.
- 5.2 THE COLOR REQUIREMENTS FOR SURFACE WIRING SHOWN IN BSP 800-612-161 SHALL ALSO APPLY TO THE 28 AND 30 GAUGE KS-CODED WIRES (TABLE 1) WHEN USED IN SURFACE WIRING.
- 5.3 WHERE 30 GAUGE TIGHT TWISTED PAIR (TABLE 1) IS USED IN SURFACE WIRING, THE CONDUCTOR COLORS SHALL BE GREEN FOR THE CONTROL LEAD AND WHITE FOR THE NON-CONTROL CONDUCTOR.

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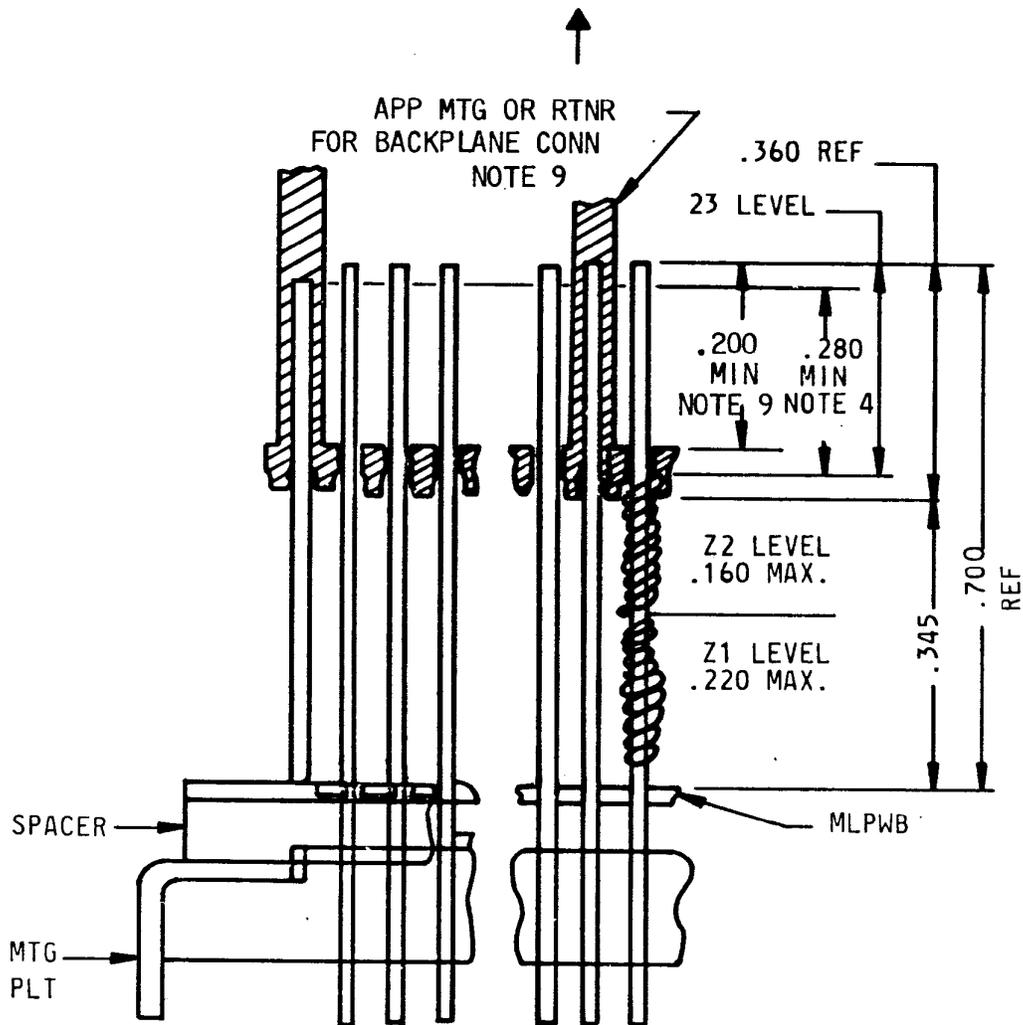


FIG.4

POSITION REQUIREMENTS FOR SOLDERLESS WIRE-WRAP CONNECTIONS
AND BACKPLANE CONNECTOR

NOTES:

1. AUTOMATIC MACHINE WIRING CONNECTION SHALL BE MADE WITHIN THE INDICATED LEVELS, (Z1,Z2).
2. IF A BACKPLANE CONNECTOR IS NOT NEEDED, A THIRD CONNECTION LEVEL (Z3) MAY BE MADE WITH HAND HELD TOOL AFTER A Z2 LEVEL CONNECTION IS MADE.
3. HAND HELD CONNECTIONS CAN BE MADE IN LEVELS Z1, Z2, Z3.
4. THIS LENGTH TO BE FREE OF WIRE WRAP AS MEASURED FROM LOWEST PIN ASSOCIATED WITH A COMMON 127 TYPE APP HOUSING BEFORE APP MTG IS PLACED ON TERMINALS.

(CON'T ON NEXT SHEET)

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5. RECOMMENDED SPACINGS BETWEEN CONNECTIONS IS: 30 GAUGE - .015
28 GAUGE - .010. HOWEVER, CONNECTIONS MAY TOUCH, BUT NOT
OVERLAP.
6. IF 28 GAUGE OFHC WIRE IS USED, NO BACKPLANE CONNECTOR MAY BE
USED IF CONNECTIONS ARE MADE TO THE Z1 AND Z2 LEVELS. IF A
BACKPLANE CONNECTOR IS REQUIRED, ONLY ONE CONNECTION IN THE
Z1 LEVEL CAN BE MADE.
7. IF 28 GAUGE ALLOY 135 WIRE IS USED ON A MINIMUM LENGTH PIN
(I.E .675"), THE MODIFIED WRAP MUST HAVE A MAXIMUM OF ONE TURN
OF INSULATED WIRE AND A MAXIMUM OF 8 TURNS OF BARE WIRE.
8. REPAIRS SHALL BE MADE IN ACCORDANCE WITH BSP 800-612-154
PARAGRAPH 3.12 ONLY. REPAIRS SHALL NOT BE SOLDERED.
9. NOMINAL EXPOSED PIN LENGTHS ARE DETERMINED BY RETAINER
CHOICE AND ARE AS FOLLOWS;

RETAINER	NOMINAL EXPOSED PIN
13A	.225
10A	.225
10B	.225
127C	.245
127D	.245
12-TYPE	.245

THE ABOVE IS APPROPRIATE FOR ALL 963NΔ, 982, 9821Δ, 942/943 AND
ALL 963PΔ EXCEPT THE 963PX. A WORST CASE ANALYSIS FOR A
CORRECT 963PX CONTACT YIELDS A MINIMUM EXPOSED PIN LENGTH
OF .205".



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TABLE 1 CODED WIRES						
TYPE	APPLICATION	CONDUCTOR MATERIAL	JACKET INSULATION (NOTE 4)	WIRES INSULATION (NOTE 4)		KS NUMBER
				MILENE	NOTES	
30 AWG-SINGLE	D TYPE SURFACE WIRING LOCAL CABLE	OFHC-TINNED ALLOY 135 OR OFHC-SILVER ALLOY 135		MILENE	1, 3	KS-21336
28 AWG-SINGLE	D TYPE SURFACE WIRING LOOSE WIRING LOCAL CABLE (PWR)	OFHC - TINNED OR ALLOY 135		MILENE		KS-21336
30 AWG-TIGHT TWISTED PAIR	D TYPE SURFACE WIRING LOOSE WIRING LOCAL CABLE	OFHC - TINNED OR ALLOY 135		MILENE		KS-21337
16 AWG - PARALLEL PAIR	LOOSE WIRING LOCAL CABLE (PWR)	TINNED COPPER (STRANDED)	MILENE	MILENE		KS-21338 (NOT AVAILABLE)
14 AWG - PARALLEL PAIR	LOOSE WIRING LOCAL CABLE (PWR)	TINNED COPPER (STRANDED)	MILENE	MILENE		
12 AWG - PARALLEL PAIR	LOOSE WIRING LOCAL CABLE (PWR)	TINNED COPPER (STRANDED)	MILENE	MILENE		
28 AWG-SINGLE-SHIELDED	LOCAL CABLE LOOSE WIRING (PWR REF)	ALLOY 135-SILVER PLATE	TEFLON	TEFLON		KS-21238
28 AWG-FIGHT TWISTED PAIR	D TYPE SURFACE WIRING LOOSE WIRING LOCAL CABLE	OFHC - TINNED OR ALLOY 135		MILENE		KS-21337
30 AWG-75 OHM COAX	LOCAL CABLE LOOSE WIRING	ALLOY 135-SILVER PLATE (SOLID)	TEFLON	TEFLON		KS-21112

CONT ON NEXT SHEET



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TABLE 1 (CONT)
CODED WIRES

TYPE	APPLICATION	CONDUCTOR MATERIAL	JACKET INSUL (NOTE 4)	WIRE INSUL (NOTE 4)	KS NO.
30 AWG- 100 OHM COAX	LOCAL CABLE LOOSE WIRING	ALLOY 135- SILVER PLATE	TEFLON	TEFLON	KS-21112
28 AWG- TIGHT PAIR -SHIELDED	LOOSE WIRE (PWR LOCAL CABLE	ALLOY 135- SILVER PLATE	TEFLON	TEFLON	KS-21238
30 AWG- SINGLE G1 WITH WHITE TRACER	FOR REPAIR PURPOSES	OFHC-TINNED OR ALLOY 135	MILENE	MILENE	KS-21336, 12

NOTES;

1. KS-21336, L1, OFHC WIRE SHALL BE USED FOR D3 OR D4 SINGLE CONDUCTOR WIRE COLORED AS SPECIFIED WHEN APPLIED MANUALLY BY SEMI-AUTOMATIC WIRING MACHINE OR FULLY AUTOMATIC WIRING MACHINE ON 1A TECHNOLOGY EQUIPMENT.
2. UNASSIGNED
3. KS-21336, L2, OR KS-21471, L2, SHALL BE USED WHEN TERMINAL HARDNESS REQUIRES ALLOY 135 WIRE.
4. REFER TO KS SPECIFICATION FOR JACKET AND WIRE INSULATION COLOR.

6. FLAT, DISCRETE AND SWITCHBOARD CABLE ASSEMBLIES-
982 TYPE CONNECTORS.

6.1 GENERAL

6.11 ALL BACKPLANE CONNECTORS SHALL BE COVER COATED IN ACCORDANCE WITH BSP 800-610-159 USING -642 FINISH, TYPE 3 APPLIED PER FINISH SPECIFICATION WL-2243. SURFACE PREPARATION: THE AREAS THAT ARE SOLDERED ARE TO BE CLEANED BY AN APPROVED METHOD.

6.12 THE STRAIN RELIEF CLAMP WHEN REQUIRED SHALL BE RIVETED TO THE CONNECTOR BOARD SO THAT IT CAN WITHSTAND A TENSIL LOAD OF 8 POUNDS PERPENDICULAR TO THE BOARD.

6.13 STAMPING OF 982 CONNECTORS THAT ARE USED IN CABLE ASSEMBLIES SHALL BE IN ACCORDANCE WITH ED-4C249-10

6.14 IF THE LUBRICANT ON THE 982 CONNECTORS IS REMOVED DURING THE MANUFACTURING PROCESS, RELUBRICATE IN ACCORDANCE WITH THE REQUIREMENTS IN SPECIFICATION X-18339.

6.15 THE CONNECTOR TERMINAL AREA SHALL BE KEPT FREE OF ANY CONTAMINATION, AND MUST PASS CLEAN REQUIREMENT PER X-18386.

6.16 SOLDER IN ACCORDANCE WITH BSP 800-610-159 PART 3F.

6.17 THE GENERAL EQUIPMENT REQUIREMENTS OF BSP 800-610-159 AND SPECIFICATION X-17988 SHALL APPLY TO ALL BACKPLANE CONNECTORS EXCEPT AS SPECIFICALLY OTHERWISE STATED.

6.2 FLAT FLEXIBLE CABLE ASSEMBLIES.

6.21 THE FLAT FLEXIBLE CABLE LISTED IN THE FOLLOWING TABLE ARE APPROVED FOR USE IN THE SYSTEMS COVERED BY THIS DOCUMENT.

NO. OF CONDUCTORS	24		31	
	INTERFRAME COMM BUS		GENERAL INTERCONNECTION	
APPLICATION				
CONDUCTOR	32 AWG-OF HC-SILVER PLT-SOLID	32 AWG-OF HC-TINNED COPPER	32 AWG-OF HC-SILVER PLT-SOLID	32 AWG-OF HC-TINNED COPPER
INSULATION	TEFLON-COLORED ON ONE SIDE-CLEAR ON OTHER ETCHED	PCV-WHITE-CODED ON ONE SIDE	TEFLON-COLORED ON ONE SIDE-CLEAR ON OTHER ETCHED	PCV-WHITE-CODED ON ONE SIDE
WIRE SPACING	.026" CENTERS			
CABLE WIDTH	.650 ± .01	.706 ± .012	.875 ± .01	.875 ± .012
CABLE THICKNESS	.030"			
NORM. NO. OF STG/CA	8		16	
PART NO.	KS-21458-L1	900A	KS-21458-L2	901A

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- 6.22 TERMINATE FLAT FLEXIBLE CABLE ON 982 TYPE CONNECTORS WITH REQUIREMENTS SHOWN IN FIG. 6B.
- 6.23 ALL FOLDS USED IN ROUTING FLAT-FLEXIBLE CABLE SHALL BE ONE OF THE TYPES SHOWN IN FIG. 6C & 6D.
- 6.24 TYPE 1, 2, 5 & 6 FOLDS OF FIG. 6D SHALL HAVE SUFFICIENT PRESSURE APPLIED TO SATISFACTORILY SET THE FOLD WHICH CAN BE RETAINED BY USING NO. 900365909 HARDMAN NO. 3672 EPOXY ADHESIVE OR EQUIVALENT, OR A HOT MELT ADHESIVE THAT CAN PROVIDE RETENTION, OR BY TAPING (TEMP-R-TAPE HM352 FROM CONN. HARD RUBBER CO. OR APPROVED EQUIVALENT).
THE FOLDS SHOULD CONFORM TO THE BEND, AND THE ADHESIVE SHALL NOT SHOW ANY EVIDENCE OF PEELING BACK.
- 6.25 THE LENGTH TOLERANCE, UNLESS OTHERWISE SPECIFIED, OF ANY FLAT-FLEXIBLE CABLE RUN BETWEEN FOLDS AND/OR TERMINATIONS SHALL BE .125 INCHES (WITH MAX. CUMULATION OF .50 FOR TOTAL CABLE).
- 6.26 GROUPS OF FLAT-FLEXIBLE CABLES SHALL BE HELD IN PROPER ORIENTATION BY LOOSELY TAPING OR TYING THE GROUP AT LOCATIONS CLOSE TO COMMON FOLDS, CABLE BREAKOUT POINTS AND AT ABOUT 8 INCH INTERVALS ALONG STRAIGHT RUNS. USE TEMP-R-TAPE HM352 FROM CONN. HARD RUBBER CO. (OR APPROVED EQUIVALENT), OR MINIATURE CABLE TIES SUCH AS PANDUIT, TYRAD ETC. IN CASE OF CABLE REMOVAL, FROM A TIED OR TAPED ASSEMBLY OF SEVERAL GROUPS ALREADY TERMINATED ON A FRAME, IT IS PERMISSIBLE, FOR ANY ONE GROUP PER ASSY AND UP TO 20% OF ALL GROUPS IN SUCH ASSY, TO CUT THE CONNECTOR(S) OFF AS CLOSE AS POSSIBLE TO THE NEAREST TIE OR TAPE POINT FROM THE AFFECTED CONN.
- 6.27 WHERE A FLAT-FLEXIBLE CABLE IS RUN WITH IT'S FLAT SIDE PARALLEL TO AND AGAINST A GROUND PLANE FOR MORE THAN 6 INCHES A NON-TERMINATED PIECE OF CABLE SHALL BE USED TO SPACE THE CABLE AWAY FROM THE GROUND PLANE.
- 6.3 DISCRETE AND SWITCHBOARD CABLE ASSEMBLIES
 - 6.31 DISCRETE CABLES (LOOSE WIRES, NO SHEATH) SHALL BE TERMINATED IN ACCORDANCE WITH THE EXAMPLE OF FIG. 6E. USE PANDUIT OR EQUIV. MINI PLASTIC TIES AND APPLY WITH INST. TOOL ADJUSTED TO MEDIUM TENSION SETTING.
 - 6.32 SWITCHBOARD CABLES (WITH SHEATH) SHALL BE TERMINATED IN ACCORDANCE WITH FIG. 6H IF THIS TYPE OF STRAIN RELIEF IS USED. THIS STRAIN RELIEF IS NOT USED, THE SHEATH SHALL BE BROUGHT TO WITHIN .250 INCH OF THE BACK OF THE CONNECTOR.

IF

- 6.33 METHOD OF TERMINATING THE SHIELD OF A SHIELDED CABLE IS SHOWN IN FIG. 6F OR 6G.
- 6.34 ON THOSE ASSEMBLIES THAT TAKE VERY SMALL GAUGE AND/OR FEW WIRES UNDER THEIR STRAIN RELIEFS, IT MAY BE NECESSARY TO PAD THESE STRAIN RELIEFS. PADDING IS TO BE DONE WITH PRESSURE SENSITIVE ADHESIVE BACKED SILICONE RUBBER PAD, APPROXIMATELY 5/16 X 3/16 AND 1/32 INCHES THICK, COHR LASTIC NO. 500 OR EQUIVALENT. THE PAD IS TO BE PLACED UNDER THE BRIDGE OF THE STRAIN RELIEF, WITH THE ADHESIVE SIDE ON THE STRAIN RELIEF AND THE RUBBER OVER THE WIRES.
- 6.35 UNLESS OTHERWISE SPECIFIED ON SWITCHBOARD CABLE ASSEMBLY DRAWINGS AT THE BUTT OF THE SWITCHBOARD CABLE ASSEMBLIES WHERE DIMENSIONS ARE REFERENCED TO THE CABLE SHEATH, A TOLERANCE OF +/- 1/2 INCH AT THE BUTT OR +/- 1 INCH OVERALL SHALL APPLY.

FOR SITUATIONS WHERE SMALL DIMENSIONS (GENERALLY LESS THAN ONE FOOT) ARE SHOWN FOR GUIDANCE IN ASSEMBLY OPERATIONS AND THE DIMENSION SHOWN IS LESS THAN ONE INCH, THE TOLERANCE IS +/- 1/8 INCH. FOR DIMENSIONS ONE INCH OR LARGER, THE TOLERANCE IS +/- 1/2 INCH.

FORMED CABLE ASSEMBLIES: THE TOLERANCE APPLICABLE TO FORMED SECTIONS OF CABLES ON A CABLE FORMING BOARD IS +/- 1/8 INCH FOR STITCH BREAKOUTS AND +/- 1/4 INCH FOR MAIN ARM AND SUBARM DIMENSIONS AND BREAKOUTS. OVERALL LENGTH TOLERANCES OF THE MAIN ARM IS +/- 1 INCH.

ONCE A CABLE HAS BEEN REMOVED FROM THE FORMING BOARD, IT SHALL BE CONSIDERED TO MEET ITS DIMENSIONAL REQUIREMENTS IF IT DRESSES PROPERLY TO THE EQUIPMENT FOR WHICH IT IS DESIGNED.

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6.4 POWER CABLES

6.41 POWER CABLES SHALL BE DESIGNED AND TERMINATED IN ACCORDANCE WITH ED-5A121-10.

6.5 OTHER CABLE ASSEMBLIES

6.51 UNLESS OTHERWISE SPECIFIED FOR OTHER TYPES OF CABLES, THE WIRES SHALL BE TERMINATED IN ACCORDANCE WITH FIG. 6E.

6.52 WIRES IN A COAXIAL CABLE OR TWISTED SHIELDED CABLE SHALL BE TERMINATED BY PREPARING THE ENDS AS IF FOR WIRE WRAP (PAR. 3) AND THEN HANDLING THE PREPARED ENDS AS IF THEY WERE DISCRETE WIRES.

6.6 TEST REQUIREMENTS

6.61 ALL DOUBLE ENDED CONNECTOR ASSEMBLIES SHALL MEET THE FOLLOWING CRITERIA:

A) EACH LEAD IN THE CABLE SHALL HAVE ELECTRIC CONTINUITY FROM THE APPROPRIATE CONNECTOR TERMINAL AT ONE END TO THE APPROPRIATE CONNECTOR TERMINAL AT THE OTHER END. WHEN THE CONNECTOR TERMINATES A NUMBER OF LEADS IN PARALLEL, EACH LEAD MUST BE ELECTRICALLY CONNECTED AT BOTH ENDS.

B) THERE SHALL BE NO ELECTRICAL CONNECTIONS BETWEEN LEADS OR TERMINALS UNLESS OTHERWISE SPECIFIED.

6.62 IN "DAISY CHAIN" CABLE ASSEMBLIES EACH LEG AND THE TOTAL LENGTH OF THE ASSEMBLY SHALL MEET THE REQUIREMENTS OF PAR. 6.61.

6.63 ALL TERMINATED LEADS SHALL HAVE AN ISOLATION RESISTANCE IN EXCESS OF 100 MEGOHMS BETWEEN EACH OTHER WHEN TESTED WITH 500 VOLTS D.C.

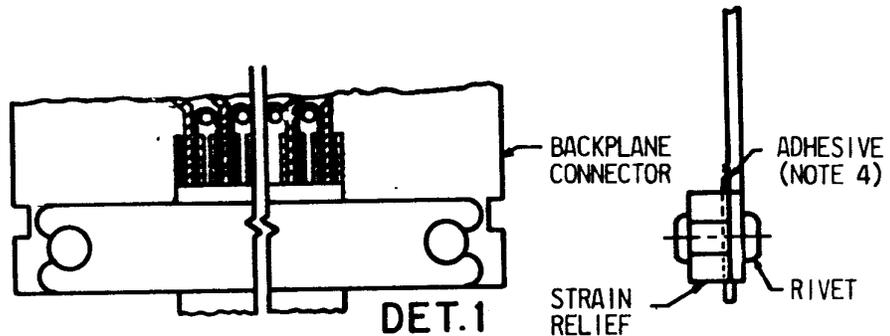
6.64 A 1000 VOLT DC BREAKDOWN TEST MAY BE USED AS AN ALTERNATIVE TO VISUAL INSPECTION OF BACKPLANE CONNECTORS IN ORDER TO MEET THE .007 MINIMUM SPACING BETWEEN CONDUCTORS.

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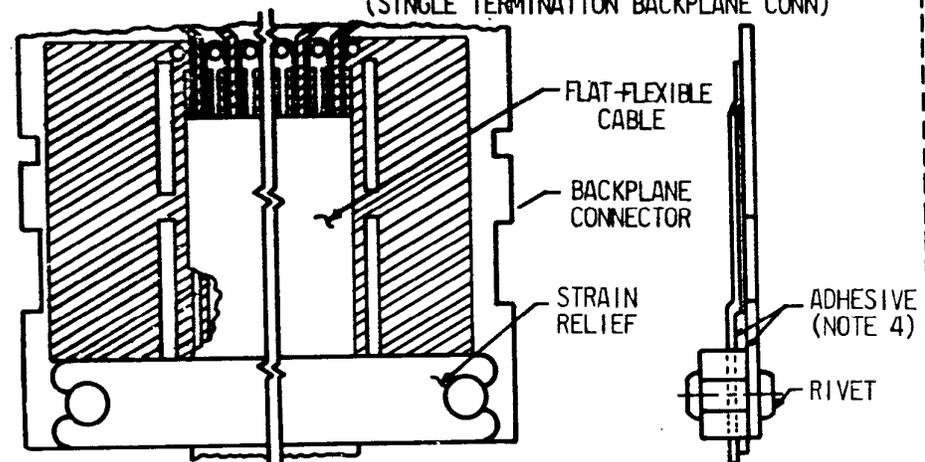
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DET.1
(SINGLE TERMINATION BACKPLANE CONN)



DET.2
(TWO TERMINATION BACKPLANE CONN)

NOTES:

1. AFTER SOLDERING, EACH WIRE MUST BE LOCATED ENTIRELY OVER THE SOLDER PAD TO WHICH IT IS TERMINATED.
2. SOLDERING SHALL CONFORM TO BSP SECTION 800-610-159 PART 3F.
3. AFTER SOLDERING, THE SOLDER JOINTS SHALL BE PROTECTED BY A CLEAR COVER COAT 642 FINISH TYPE 3 APPLIED PER FINISH SPECIFICATION WL-2243.
4. ADHESIVE PER PAR. 6.24.
5. UNASSIGNED
6. THE CUTTING LENGTH OF THE FLAT RIBBON CABLES SHALL BE DETERMINED BY ADDING .125 INCH TO EACH END OF CABLE TERMINATED BY THIS METHOD.

FIG.6B

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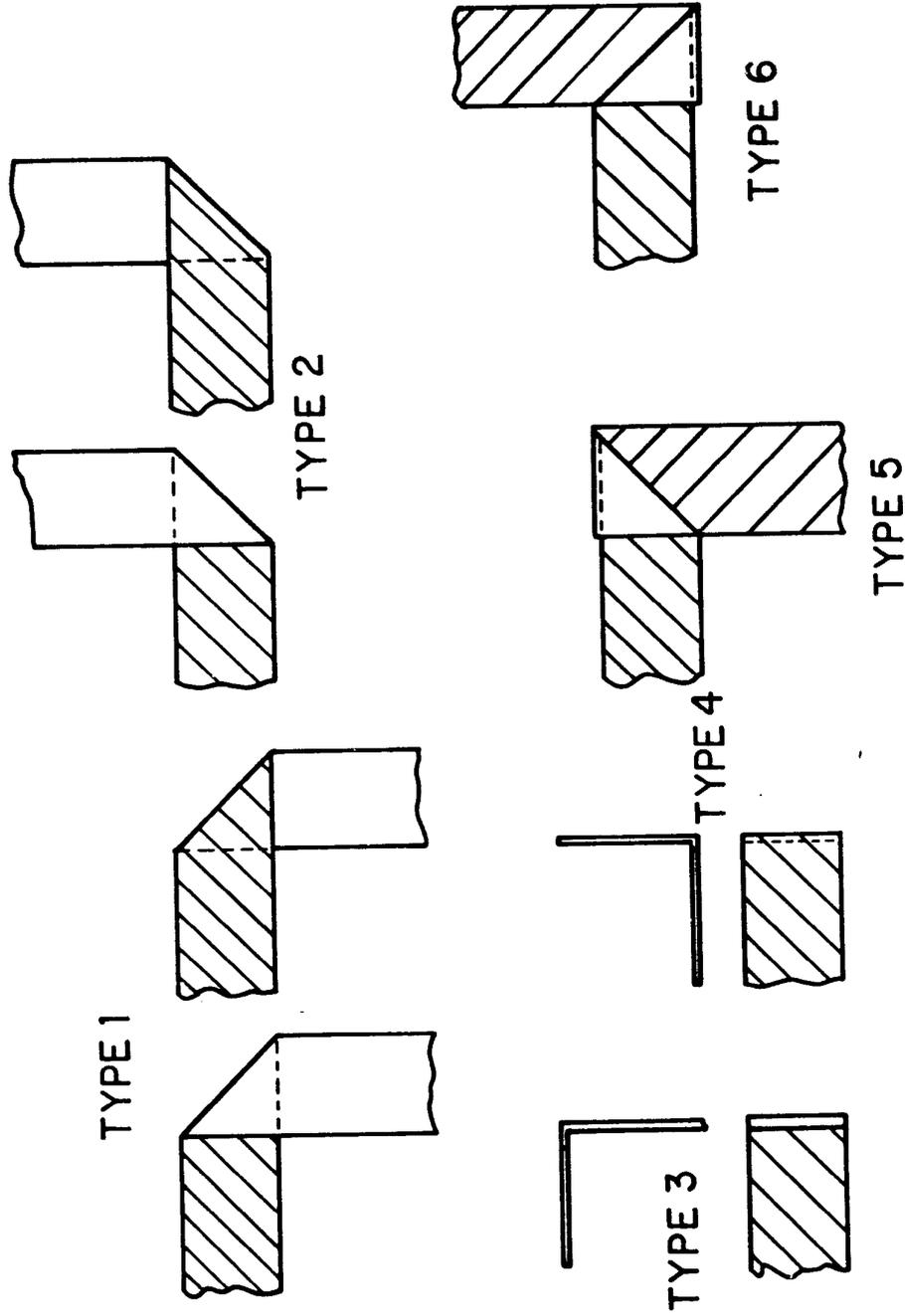
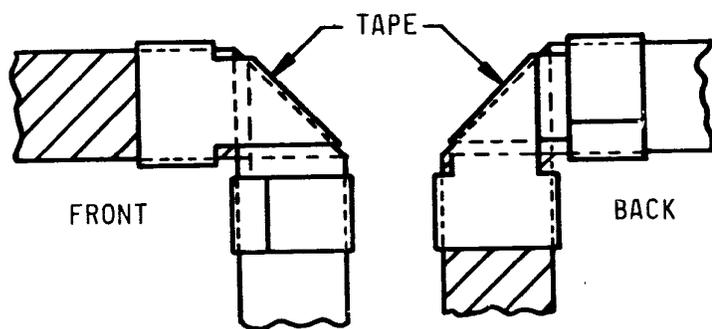


FIG. 6C

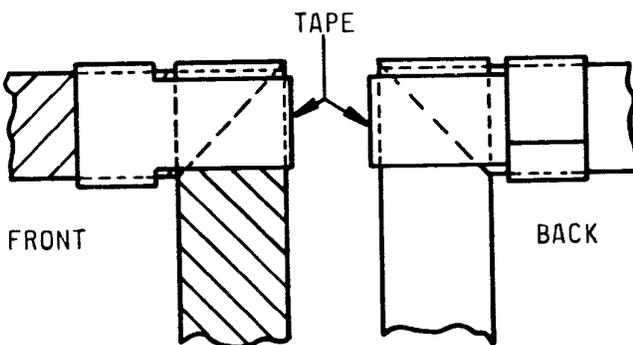




FIG. 6D



TYPE 1 & 2 FOLDS



TYPE 5 & 6 FOLDS



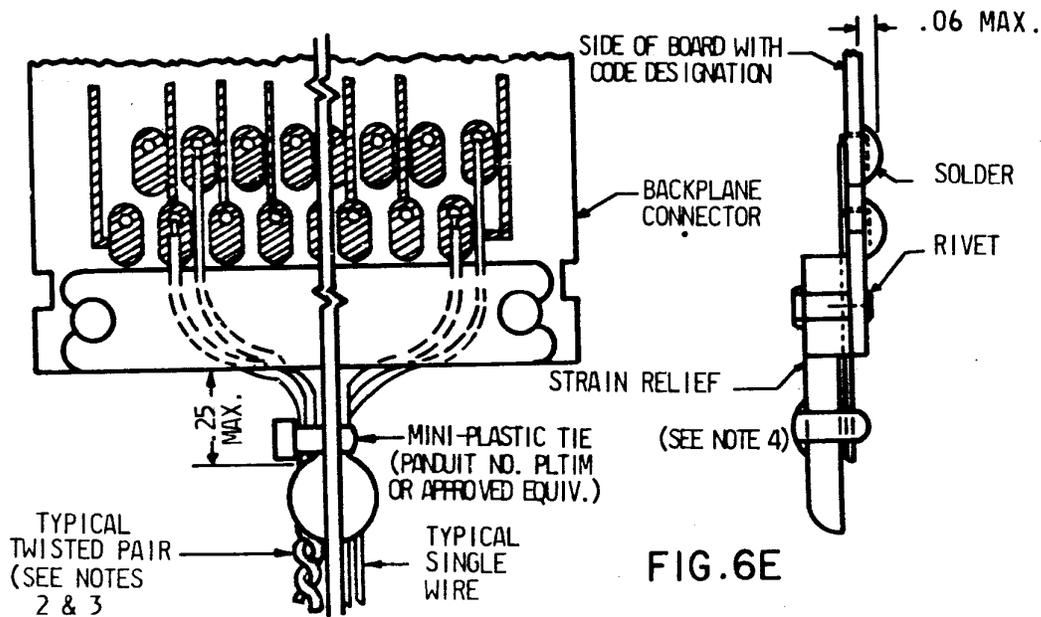


FIG. 6E

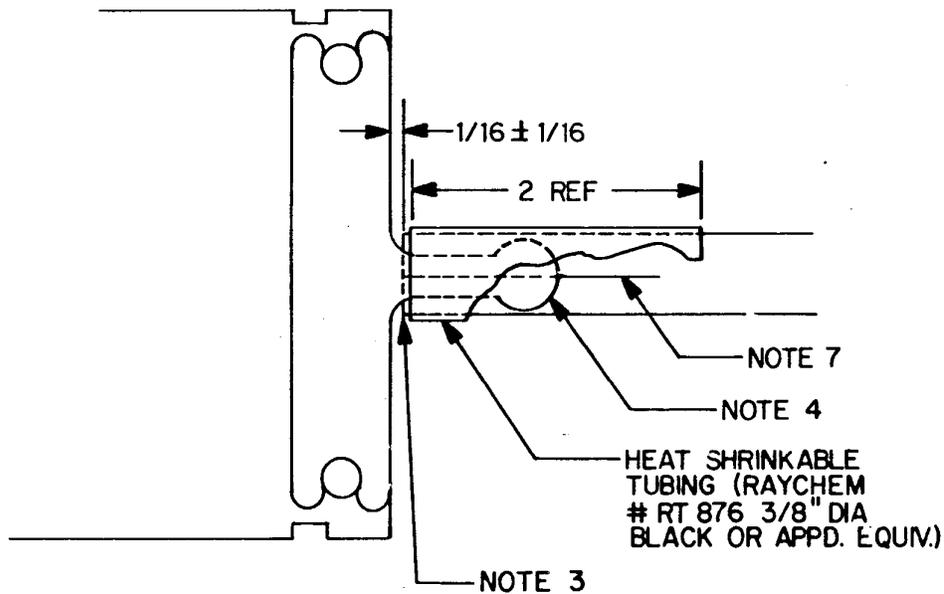


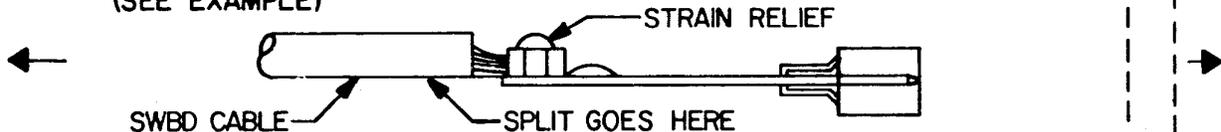
FIG. 6H

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NOTES:

1. WIRES ARE CLINCHED ON THE OPPOSITE SIDE OF BOARD THAN CODE DESIGNATION.
2. WHEN TWISTED PAIR IS TERMINATED THE TWISTED PORTION OF THE PAIR COME TO WITHIN .25 INCHES OF THE BACK OF THE CONNECTOR.
3. THE CABLE SHEATH ON ALL SWITCHBOARD CABLE ASSEMBLIES MAY BE EVEN WITH (CONN SIDE) OR EXTEND BEYOND THE HEAT SHRINKABLE TUBING. SWITCHBOARD CABLE ASSEMBLIES USING 840984934 STRAIN RELIEFS MUST HAVE THE KNOB OF THE STRAIN RELIEF BETWEEN THE CABLE SHEATH AND HEAT SHRINK TUBING. (SEE FIG. 6H)
4. CABLE ASSEMBLIES USING TWISTED PAIR OR SINGLE WIRE SHALL NOT HAVE ANY WIRES ON THE PRINTED BOARD PORTION OF THE BACKPLANE CONNECTOR CROSSED IN THE PROCESS OF SOLDERING TO THE BACKPLANE CONNECTOR.
5. DIMENSIONS, I.D. AND LENGTH, OF HEAT SHRINKABLE TUBING ARE PRIOR TO HEAT PROCESS BEING APPLIED.
6. USE STRAIN RELIEF FURNISHED WITH CONN. IF A DIFFERENT RELIEF IS NEEDED, USE ITEM SPECIFIED IN CA ASSY. DWG.
7. CABLE SHEATH MAY BE SLIT 1 5/8 TO 1 3/4 INCHES TO FACILITATE MANUFACTURING, BUT SLIT MUST FACE AWAY FROM STRAIN RELIEF. (SEE EXAMPLE)



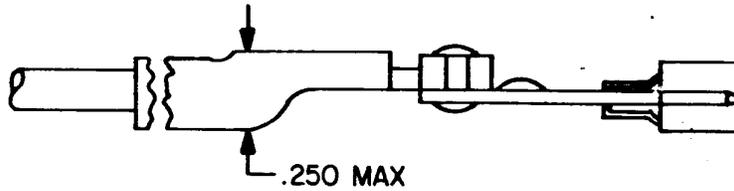
8. THE RECOMMENDED SKIN LENGTH FOR 982 AA-AE BACKPLANE CONNECTORS IS 1 INCH, AND FOR 982 AH, AJ, BD TYPE BACKPLANE CONNECTORS IS 1 3/8 INCHES. ANY VARIABLE SKIN LENGTHS FOR 982 TYPE CONNECTORS, WHEN REQUIRED, WILL BE CONTROLLED BY THE MANUFACTURING SHOPS.
9. THE TWISTING OF THE CABLE BUNDLE TO REDUCE SLACK UNDER HEAT SHRINK TUBING IS NOT PERMITTED.
10. ALL WIRES MUST BE IN THEIR NORMAL POSITIONS WHEN SLITTED PORTION OF SHEATH IS REINSTALLED.
11. ANY SLACK IN LEADS MUST BE WORKED BACK INTO SHEATH BEHIND HEAT SHRINKABLE TUBING AREA.

(CONT ON NEXT PAGE)

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12. FOR FRAMES THAT REQUIRE CABLES TO BE PLUGGED IN ADJACENT TO EACH OTHER ON 1/4 INCH CENTERS THE CABLE AND SHEATH MAY BE FLATTENED TO FORM AN OVAL TO MEET THE REQUIREMENT AS DEPICTED BELOW.



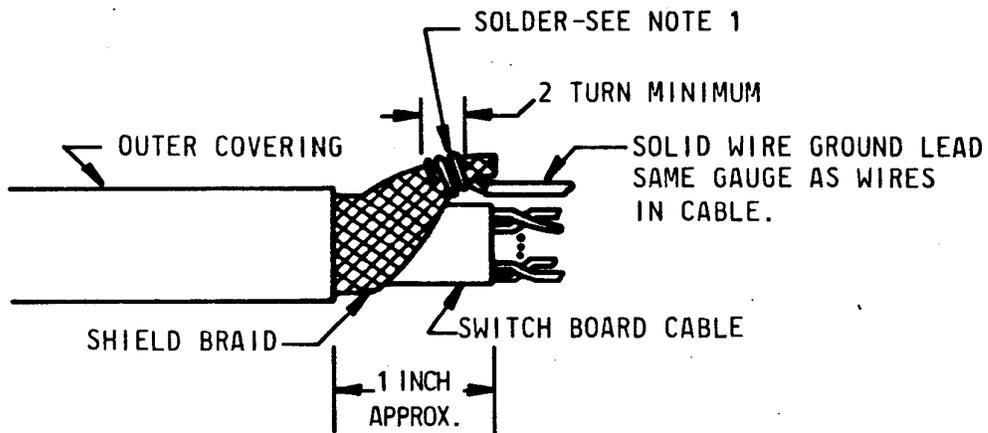
HOWEVER THE BTL DESIGNER WILL HAVE TO INDICATE ON THE SPECIFIC CABLE DRAWING (S) IF ANY TYPE OF SPECIAL HANDLING WILL BE REQUIRED FOR THE MANUFACTURE OF THESE CABLES.

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FIG. 6F

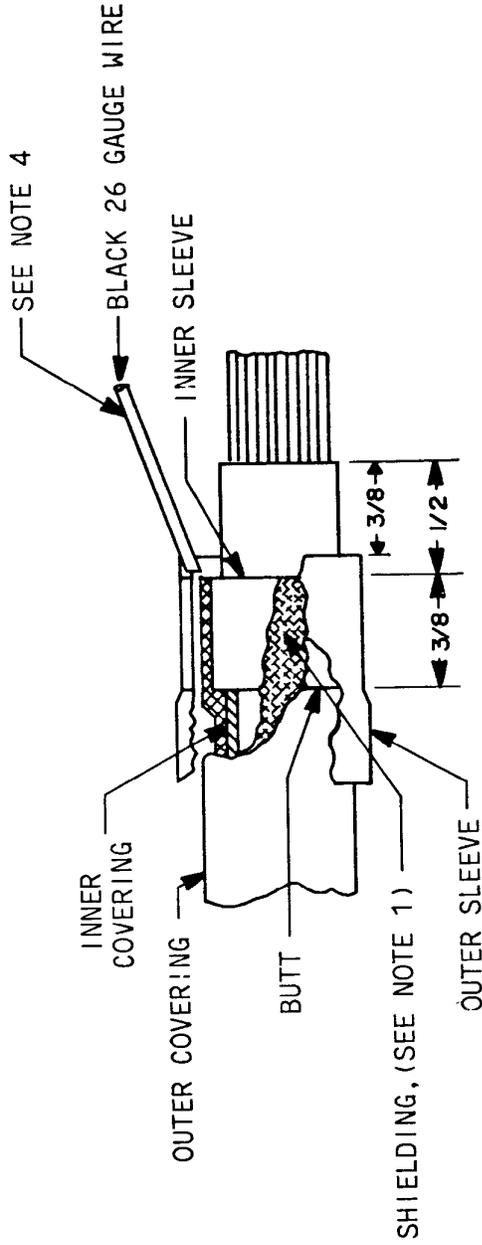


NOTES:

1. SOLDER PER MPS-50016 - THERE SHALL BE GOOD SOLDER WETTING BETWEEN THE SHIELD AND AT LEAST ONE FULL CONSECUTIVE TURN OF GRND. WIRE.
2. COVER CONNECTION WITH AN OVERLAPPING LAYER OF TAPE OR HEAT SHRINKABLE TUBING.

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FIG. 6G



NOTES:

1. ALL BARE SHIELDING ON CABLE END MUST BE COVERED COMPLETELY BY THE INSULATED OUTER SLEEVE FOR THAT CABLE END.
2. CRIMP OUTER SLEEVE WITH APPROPRIATE CRIMPING TOOL.
3. GSB 312, GSB 287, GSR 415 & GSR 375 THOMAS & BETTS OR EQUIV.
4. SOLDER PER MPS-50016-THERE SHALL BE GOOD SOLDER WETTING BETWEEN THE SHIELD AND WIRE.

CABLE	INNER SLEEVE	OUTER SLEEVE
807AS	GSB 312	GSR 415
816AS	GSB 287	GSR 375

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6.7 SPECIAL BACKPLANE TESTING REQUIREMENTS

WHEN CAPACITANCE TESTING OF BACKPLANE WIRING IS REQUIRED ON A UNIT, THE CIRCUIT DRAWING WILL HAVE AN EQUIPMENT NOTE SPECIFYING AN X-SPECIFICATION CONTAINING THE NETS TO BE CHECKED. THIS TEST IS TO BE CONDUCTED AFTER ALL AUTOMATIC WIRING IS COMPLETED AND VERIFIED BY BEFORE CIRCUIT PACK INSTALLATION. THE MEASUREMENT SHALL BE MADE USING AN INSTRUMENT HAVING AN ACCURACY WITHIN 2% AND AT A FREQUENCY OF 100KHZ.

THE TEST WILL BE CONDUCTED IN TWO PARTS.

PART 1. TESTING FOR CONNECTOR PIN CAPACITANCE

- (A) SELECT A MINIMUM OF 25 UNUSED CONNECTOR PINS IN THE UNIT BEING TESTED FROM ALL MOUNTING LEVELS AND NO TWO PINS SHALL BE IN THE SAME CONNECTOR. UNUSED PINS ARE THOSE HAVING NO CONNECTIONS AT THE TIME OF TEST.
- (B) MEASURE THE CAPACITANCE TO GROUND (C_N) OF EACH PIN AND CALCULATE THE MEAN CAPACITANCE, C_{CONN} .

$$C_{CONN} = \frac{C_1 + C_2 + \dots + C_N}{N}$$

N=NUMBER OF PINS SELECTED

←

ALL INDIVIDUAL PIN READINGS AND THE MEAN CAPACITANCE VALUE SHALL BE IN THE RANGE OF 3.5 TO 4.5 PF.

PART 2. TESTING FOR WIRED NETS CAPACITANCE

- (A) MEASURE THE CAPACITANCE TO GROUND (C_{TN}) OF EACH NET AT ONE OF THE POINTS SPECIFIED IN THE X-SPEC NOTED IN THE CIRCUIT DRAWING.
- (B) CALCULATE THE TOTAL CAPACITANCE OF ALL NETS TESTED

$$C_T = C_{T1} + C_{T2} + \dots + C_{TN}$$

- (C) THE UNIT MUST MEET THE FOLLOWING CRITERION:

$$\frac{C_T - N_C C_{CONN}}{L_N} \leq 1.25 \text{ PF/IN.}$$

WHERE: N_C = TOTAL NUMBER OF PINS IN ALL NETS
 L_N = TOTAL LENGTH OF ALL NETS

THESE NUMBERS WILL ALSO APPEAR IN THE X-SPEC NOTED IN THE CIRCUIT DRAWING.

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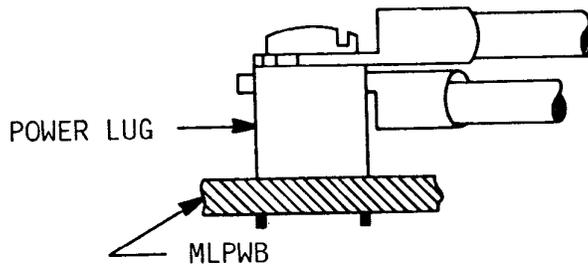
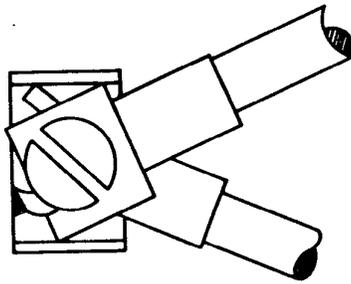
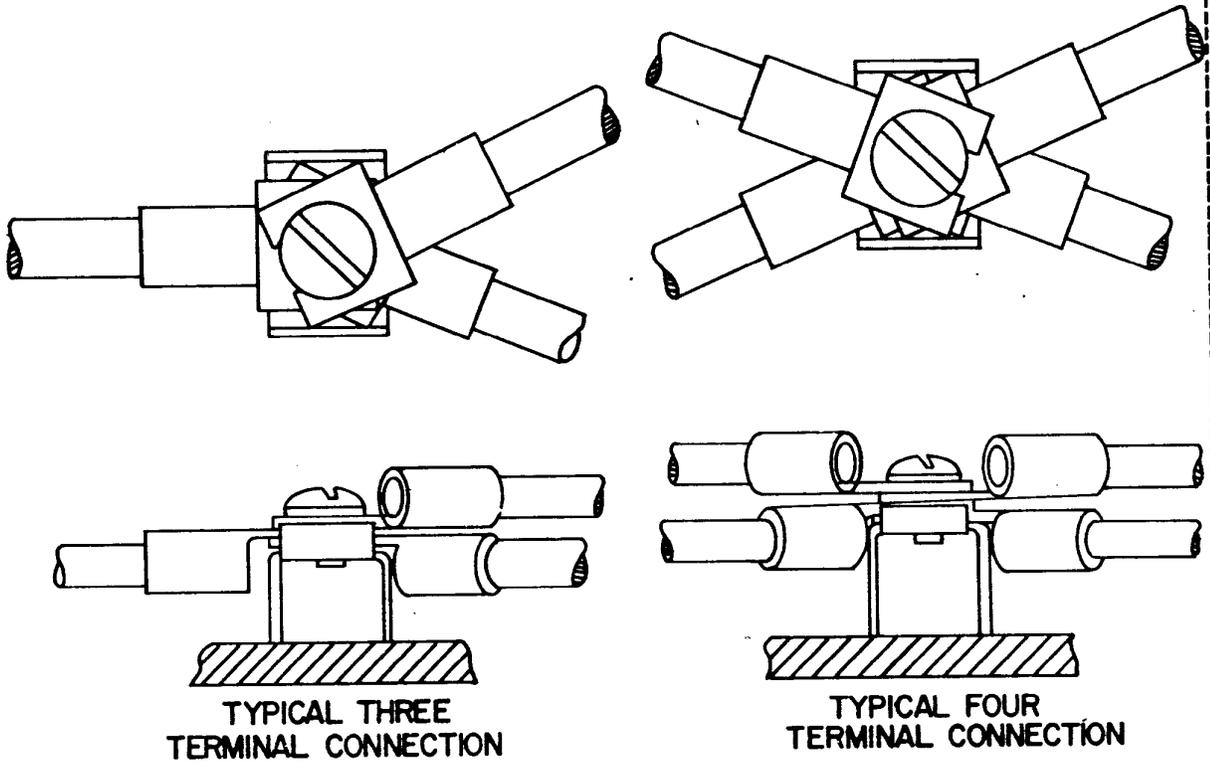


FIG. 6I

NOTES:

1. TERMINALS SHOULD NOT REST ON LUG PROJECTIONS
2. TORQUE REQUIREMENT TO BE 4 INCH POUNDS MINIMUM

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TYPICAL THREE
TERMINAL CONNECTION

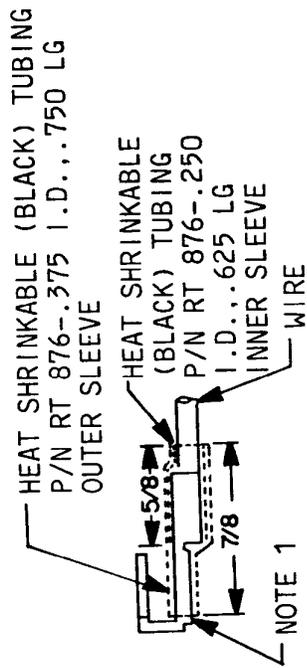
TYPICAL FOUR
TERMINAL CONNECTION

FIG. 6J

- NOTES:
- 1. TERMINALS SHOULD NOT REST ON LUG PROJECTIONS.
 - 2. TORQUE REQUIREMENTS TO BE 4 INCH POUNDS MINIMUM.

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SK-A
STRAIGHT PUSH ON TYPE TERMINAL LUG

SK-B

RECEPTACLE & TAB COMBINATION TYPE
PUSH ON TERMINAL LUG

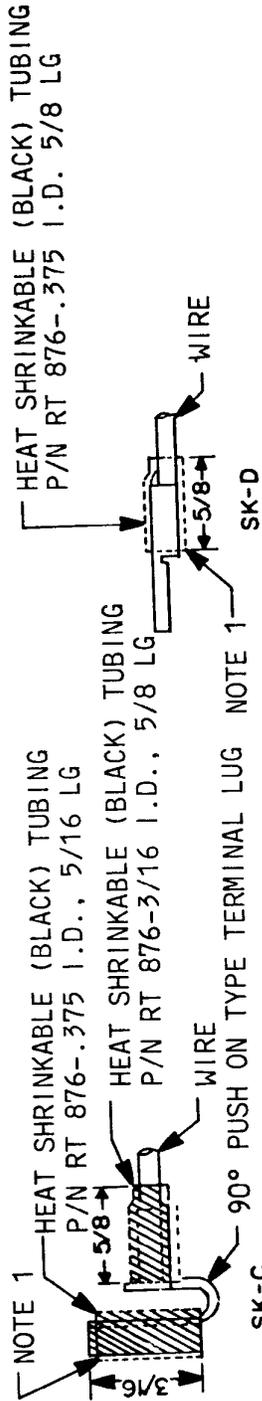


FIG. 6K

TYPICAL HEAT SHRINKABLE SLEEVING FOR PUSH ON TYPE TERMINALS

NOTE 1. AFTER SLEEVING APPLICATION THERE SHALL BE AN APPROXIMATE 1/16" SPACE BETWEEN THE SLEEVE AND OPEN LUG END.

7. END PRODUCT REQUIREMENTS FASTECH

7.1 THERE SHALL BE NO CONDUCTING PARTICLES IN FASTECH TECHNOLOGY FRAMES.

7.1.1 DUE TO THE CLOSE SPACING OF THE BACKPLANE PINS ON THIS EQUIPMENT, SPECIAL CARE MUST BE TAKEN TO REMOVE ALL CONDUCTING DEBRIS FROM FASTECH TECHNOLOGY BACKPLANES. THE SEVERITY OF DEBRIS DEFECT IS DETERMINED BY THE TYPE OF BACKPLANE ASSOCIATED WITH THE UNIT IN WHICH THE CONDUCTING DEBRIS IS FOUND. THE FOLLOWING TABLE SHOWS THE CLASS OF SEVERITY FOR DEBRIS FOUND IN THE BACKPLANE PIN FIELD:

8. 3B5 COMPUTER SYSTEM

AN OXYGEN INHIBITING COMPOUND (I.E. NO-OX) IS NOT REQUIRED FOR MANUFACTURING OF THIS PRODUCT. ALL BSP REQUIREMENTS FOR NO-OX ARE WAIVED UNLESS OTHERWISE SPECIFICALLY REQUIRED.

TYPE OF BACKPLANE	PARTICLE SIZE		
	≥.025", <.065"	≥.065", <.100"	≥.100"
FASTECH TECHNOLOGY .025" SQ PINS ON .125" CENTERS; NOMINAL .100" CLEARANCE BETWEEN PINS:			
PINS STAKED TO LANDS WITH NOMINAL .025" CLEARANCE	2	3	4
PINS STAKED BUT LANDS PROTECTED BY COVER COAT.		2	4

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8. 3B5 COMPUTER SYSTEM

AN OXYGEN INHIBITING COMPOUND (I.E., "NO-OX")
IS NOT REQUIRED FOR THIS PRODUCT. ALL AT&T PRACTICES
REQUIREMENTS FOR "NO-OX" ARE WAIVED, UNLESS
OTHERWISE SPECIFIED.

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