

## DEDICATED PLANT

### BURIED CABLE — CONTROL AND ACCESS POINTS

### WIRING ARRANGEMENTS

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#### 1. GENERAL

**1.01** The capacities listed in Paras. 1.03, 1.04 and 1.05, reflect the use of 80 Type distribution brackets to permit identification of the "OUT PIC Stub Cable" by twenty-five pair binder groups. Under no conditions should these capacities be exceeded.

**1.02** This section is revised to update general information. Arrows ordinarily used to indicate changes have been omitted.

**1.03** The QCH1C is now obsolete, but was used as a control or access point and was capable of holding a maximum of 600 IN and 600 OUT pairs with 24 or 26 gauge. The total number of IN pairs is less, if coarser gauge is used. A maximum of 6 cable sheaths could be terminated in a QCH1C.

**1.04** The QCH2C is now obsolete but was used as a control or access point and was capable of holding a maximum of 400 IN and 300 OUT pairs with 24 or 26 gauge. Total number of IN pairs is less, if coarser gauge was used. A maximum of 4 cable sheaths could be terminated in a QCH2C.

**1.05** The QTC12B may be used as a control or access point. Optional panels are available to accept up to a maximum of 900 IN and OUT pairs with 24 or 26 gauge. Total number of IN pairs is to be decreased when coarser gauge is used. A maximum of 6 cable sheaths may be terminated in a QTC12B.

**1.06** The QTC11A is used simultaneously as a control and access point under the same closure. The capacities are the same for both the control and access point. A maximum of 900 IN and 900 OUT pairs are permitted in each, control and access point. A maximum of 6 cable sheaths may be terminated in each, control and access point.

#### 2. HARDWARE

##### 2.01

(a) **Plastic Bags:** used with plugging compound for clearing and capping the ends of the IN cable binder groups at cable ends. The bags come in two sizes 4" x 8" and 3" x 5". B Plastic Cap may be substituted.

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(b) **B Wire Connectors:** used to connect IN cable pairs to OUT cable pairs. They are pressed on the conductors with a B connector presser as described in Division 632.

(c) **Warning Marker Form E-5190:** used to identify special services circuits. This tape is mounted on dispenser cards and when required is peeled off the card and wrapped around the B Wire Connector.

(d) **Insignia Adhesive:** are used for identifying control and access points. The insignia C and P will designate a control point while A and P will be used to designate an access point.

(e) **Cable Unit Markers:** used to identify individual binder groups in the cables.

### 3. CONTINUOUS PIC SHEATH COUNT

**3.01** Continuous PIC Sheath Count is a technique for identifying groups in Control and Access Points.

**3.02** Continuous PIC Sheath Count aids in making the pair connections and identification

within a control or access point closure and is accomplished by assigning:

(a) A consecutive pair count starting with pair one to all of the IN cable pairs appearing in the closure regardless of the number of cable sheaths involved.

(b) A consecutive pair count starting with pair one to all of the OUT cable pairs appearing in the closure regardless of the number of cable sheaths involved.

(c) Cable Unit Markers of both IN and OUT cables will be made continuous to correspond to these counts as shown in Table A. By this technique, each control or access point will appear to have only one IN and one OUT cable; thus, making pair identification easier.

(d) If a cable stub entering a control or access point contains both IN and OUT pairs the cable will be identified accordingly. The centre groups of the cable will normally contain the OUT cable pairs.

TABLE A

## CONTINUOUS PIC SHEATH COUNT AND BINDER GROUP COLOUR

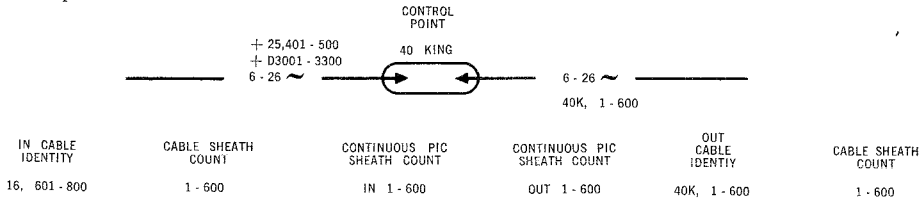
Cable Unit Marker No.	Continuous PIC Sheath Count	Binder Group Colour	Cable Unit Marker No.	Continuous PIC Sheath Count	Binder Group Colour	Cable Unit Marker No.	Continuous PIC Sheath Count	Binder Group Colour
1	1-25	Bl-W	25	601-625	Bl-W, R	49	1201-1225	Bl-W, Bk
2	26-50	O-W	26	626-650	O-W, R	50	1226-1250	O-W, Bk
3	51-75	G-W	27	651-675	G-W, R	51	1251-1275	G-W, Bk
4	76-100	Br-W	28	676-700	Br-W, R	52	1276-1300	Br-W, Bk
5	101-125	S-W	29	701-725	S-W, R	53	1301-1325	S-W, Bk
6	126-150	Bl-R	30	726-750	Bl-R, R	54	1326-1350	Bl-R, Bk
7	151-175	O-R	31	751-775	O-R, R	55	1351-1375	O-R, Bk
8	176-200	G-R	32	776-800	G-R, R	56	1376-1400	G-R, Bk
9	201-225	Br-R	33	801-825	Br-R, R	57	1401-1425	Br-R, Bk
10	226-250	S-R	34	826-850	S-R, R	58	1426-1450	S-R, Bk
11	251-275	Bl-Bk	35	851-875	Bl-Bk, R	59	1451-1475	Bl-Bk, Bk
12	276-300	O-Bk	36	876-900	O-Bk, R	60	1476-1500	O-Bk, Bk
13	301-325	G-Bk	37	901-925	G-Bk, R	61	1501-1525	G-Bk, Bk
14	326-350	Br-Bk	38	926-950	Br-Bk, R	62	1526-1550	Br-Bk, Bk
15	351-375	S-Bk	39	951-975	S-Bk, R	63	1551-1575	S-Bk, Bk
16	376-400	Bl-Y	40	976-1000	Bl-Y, R	64	1576-1600	Bl-Y, Bk
17	401-425	O-Y	41	1001-1025	O-Y, R	65	1601-1625	O-Y, Bk
18	426-450	G-Y	42	1026-1050	G-Y, R	66	1626-1650	G-Y, Bk
19	451-475	Br-Y	43	1051-1075	Br-Y, R	67	1651-1675	Br-Y, Bk
20	476-500	S-Y	44	1076-1100	S-Y, R	68	1676-1700	S-Y, Bk
21	501-525	Bl-V	45	1101-1125	Bl-V, R	69	1701-1725	Bl-V, Bk
22	526-550	O-V	46	1126-1150	O-V, R	70	1726-1750	O-V, Bk
23	551-575	G-V	47	1151-1175	G-V, R	71	1751-1775	G-V, Bk
24	576-600	Br-V	48	1176-1200	Br-V, R	72	1776-1800	Br-V, Bk

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### EXAMPLES

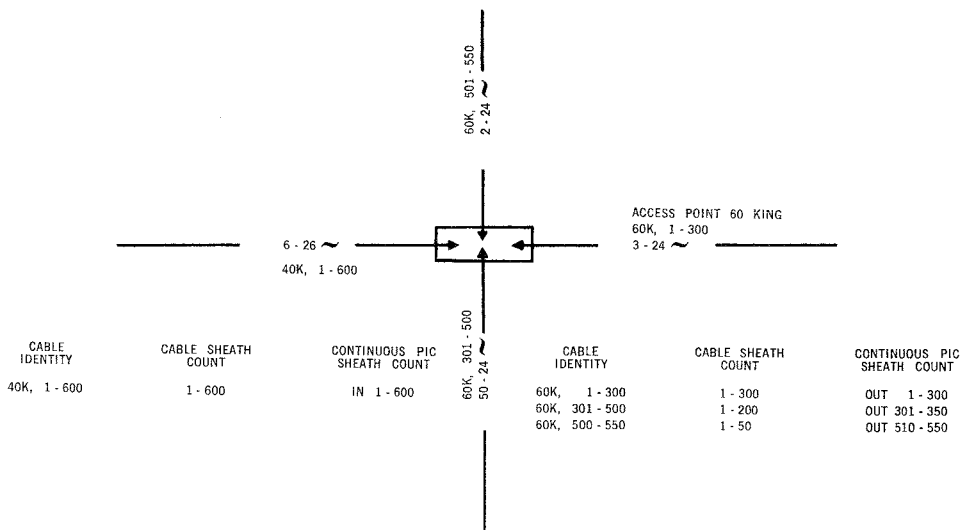
Examples of the application of the Continuous PIC Sheath Count method of identifying cable pairs in a control or access point are illustrated below:

#### Example I



In Example I there is one PIC cable entering the control point and one PIC cable leaving. It is not necessary in the case to re-identify any of the binder groups since the normal sheath count already corresponds to the Continuous PIC Sheath Count principle of one IN cable and one OUT cable, however cable unit markers should be placed.

#### Example II



In this case there is one IN cable and three OUT cables. It is still unnecessary to re-identify the binder groups of the IN cable since the cable sheath count already corresponds to the Continuous PIC Sheath Count principle. However, it is necessary to re-identify the ten binder groups in the 2-26 ~ and the 50-24 ~ OUT cables. When the groups are properly identified there appears to be only one OUT cable with 22 binder groups.

TABLE B illustrates the method of establishing the Continuous PIC Sheath Count by revising the binder groups.

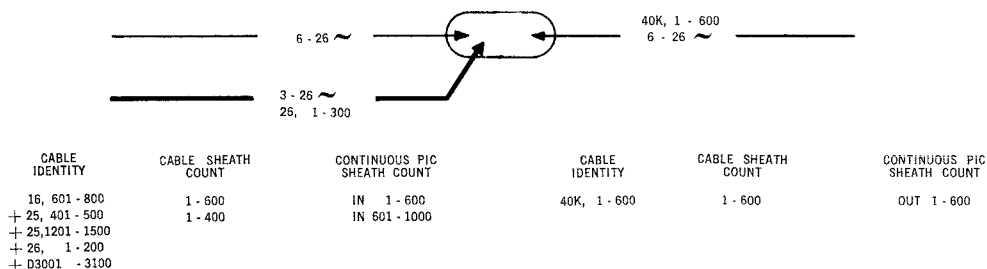
TABLE B

**EXAMPLE OF ESTABLISHING CONTINUOUS PIC SHEATH COUNT  
IN A CONTROL OR ACCESS POINT**

OUT CABLES				IN CABLES			
Cable PIC Sheath Count	Cable Binder Group	Continuous PIC Sheath Count	Unit Marker to use for Continuous Binder Group	Cable PIC Sheath Count	Cable Binder Group	Continuous PIC Sheath Count	Unit Marker to use for Continuous Binder Group
1-25	Bl-W	1-25	1	1-25	Bl-W	1-25	1
26-50	O-W	26-50	2	26-50	O-W	26-50	2
51-75	Gr-W	51-75	3	51-75	Gr-W	51-75	3
76-100	Br-W	76-100	4	76-100	Br-W	76-100	4
101-125	S-W	101-125	5	101-125	S-W	101-125	5
126-150	Bl-R	126-150	6	126-150	Bl-R	126-150	6
151-175	O-R	151-175	7	151-175	O-R	151-175	7
176-200	Gr-R	176-200	8	176-200	Gr-R	176-200	8
201-225	Br-R	201-225	9	201-225	Br-R	201-225	9
226-250	S-R	226-250	10	226-250	S-R	226-250	10
251-275	Bl-Bk	251-275	11	251-275	Bl-Bk	251-275	11
276-300	O-Bk	276-300	12	276-300	O-Bk	276-300	12
1-25	Bl-W	301-325	13	301-325	Gr-Bk	301-325	13
26-50	O-W	326-350	14	326-350	Br-Bk	326-350	14
51-75	Gr-W	351-375	15	351-375	S-Bk	351-375	15
76-100	Br-W	376-400	16	376-400	Bl-Y	376-400	16
101-125	S-W	401-425	17	401-425	O-Y	401-425	17
126-150	Bl-R	426-450	18	426-450	Gr-Y	426-450	18
151-175	O-R	451-475	19	451-475	Br-Y	451-475	19
176-200	Gr-R	476-500	20	476-500	S-Y	476-500	20
1-25	Bl-W	501-525	21	501-525	Bl-V	501-525	21
26-50	O-W	526-550	22	526-550	O-V	526-550	22
				551-575	Gr-V	551-575	23
				576-600	Br-V	576-600	24

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### Example III



In Example III a 3-26 ~ IN cable from the switching centre has been added. The 3-26 ~ will have to be re-identified and will join with the 6-26 ~ to form an IN cable with 40 binder groups — the OUT cables will be identified as in Example I.

#### 4. CABLE INSTALLATION

**4.01** Whenever practicable, the IN cable from the switching centre side should enter on the left hand side as viewed from the front of the cabinet and the OUT cable enters on the right side. This method is not always possible thus the need for proper identification.

PIC SHEATH COUNT	TO CA. NO. COUNT	NO. OF PAIRS

#### 4.02 Cable End Locations

- (a) QCH1C and QCH2C information on cable end location is not covered as those closures are now obsolete.
- (b) QTC12B and QCH11A. The cable should continue for 36 inches above the ground lug slots.
- (c) Clear and cap the IN cable using a Plastic Bag or Plastic Cap as outlined in Division 633 on Capping Cable Ends.

#### Grounding Method

- 4.03 Remove the cable sheath and aluminum shield  $\frac{3}{4}$  inch below the hole in the grounding bracket where the stud of the Z Bond Clamp will connect.
- 4.04 Measure a distance of 3 inches from the sheath opening and mark with B Paper Tape.
- 4.05 Using B Tabbing Shears cut one longitudinal slit *ONLY* in the outer sheath and aluminum shield up to the Paper Tape Marker on the opposite side of the cable to where the Z Bond Clamp is to be installed. (See Fig. 1).

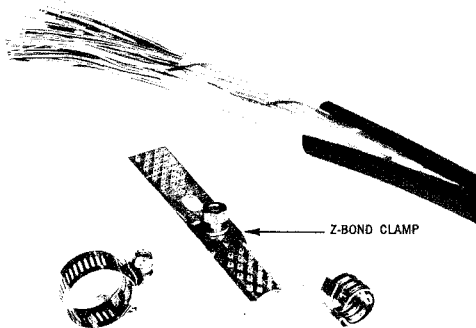


Fig. 1 — Material & Slit

- 4.06 Insert the whole curved portion of the Z Bond Clamp between the core wrap and the aluminum shield on the opposite side to the slit. (See Fig. 2).

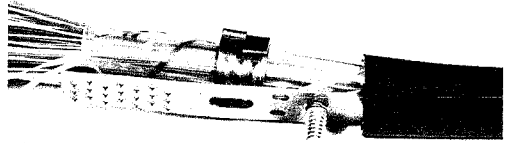


Fig. 2 — Z Bond Clamp Insertion

- 4.07 Slide an Inner Sheath Clamp under the sheath until it is centered under the perforated portion of the Z Bond Clamp.
- 4.08 Fold back the exposed portion of the Z Bond Clamp, hinging it at the two holes near the stud. Lay the exposed end of the bonding

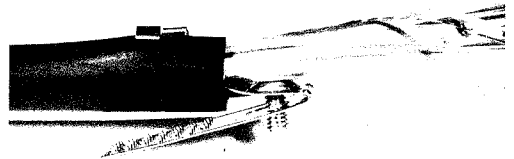
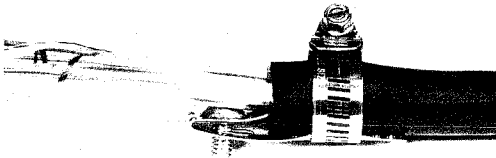


Fig. 3 — Folded Bond Clamp and Inserted Inner Sheath Clamp

clamp flat against the cable sheath engaging the stud into the slot. (See Fig. 3).

- 4.09** Place a Sealing Clamp over the Sheath, Z Bond Clamp, and Inner Sheath Clamp so that the gearhousing of the Sealing Clamp is directly on top of the ears of the Inner Sheath Clamp. Tighten securely. (See Fig. 4).



**Fig. 4 — Bonding Arrangement Completed**

- 4.10** Insert the stud of the Z Bond Clamp in the appropriate hole in the grounding bracket or tab and tighten securely using the lock nut provided.

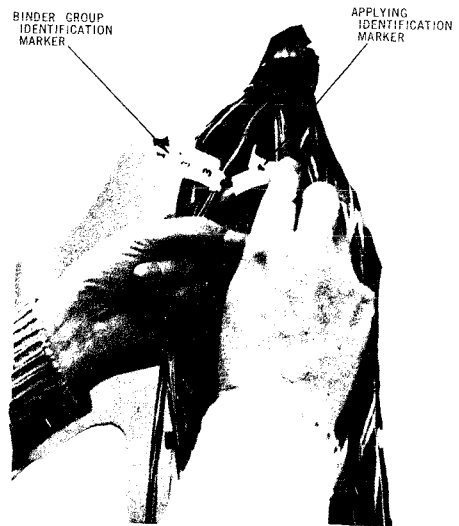
## 5. CABLE PREPARATION AND BINDER GROUP IDENTIFICATION

- 5.01** To facilitate pair connection and identification in control and access points a continuous PIC Sheath Count will be established for all IN and OUT cables. This method is described in Part 3 of this practice.

- 5.02** It will be necessary in many cases to mark the binder groups with a Unit Marker which differs from that normally associated with the cable sheath in accordance with the Continuous PIC Sheath Count Method.

- 5.03** Identify the IN and OUT cables using the Dymo Tape Writer. The Dymo Tag should include the word IN or OUT according to the cables designation, plus the count of the cable.

- 5.04** Before removing the unit binder, wrap each binder group of the IN and OUT cable or cables with the cable unit marker using the number that corresponds with the group, (e.g. Blue White = No. 1) unless a change is required to correspond to the Continuous PIC Sheath Count. Place the markers near the butt of the cable and near the end of the cleared or wrapped cable groups. (See Fig. 5)



**Fig. 5**

- 5.05** The continuous PIC Sheath Count and Cable Unit Marker to use for binder group identification are listed in Table A.

## 6. CAPPING SPARE IN CABLES

- 6.01** Clear the ends of the spare IN cable pairs using a Plastic Bag or Plastic Cap as described in Division 633 on Capping Cable Ends.

## 7. CONNECTING IN THE QCH1C

- 7.01** The QCH1C is equipped with double channelling rings and distribution brackets as shown in Figs. 6 and 7.

**7.02** A maximum of 200 pairs (one IN + one OUT = 1 pair) may be connected at each channelling ring level (100 pr each side of the closure). This allows a maximum capacity of 600 OUT pairs for the QCH1C Closure.

**7.03 IN Cable:**

(a) Place the IN cable from the switching centre side through the channelling rings on the left hand side as viewed from the front of the closure.

(b) Clear and cap the IN cable using a Plastic Bag or Plastic Cap as outlined in Division 633 on Capping Cable Ends.

**7.04 OUT Cables:**

(a) Route the OUT cable binder groups through the right hand channelling rings and lay across the top of the wiring brackets. The binder group colour codes must correspond to the colour code on the front of the distributing bracket.

(b) Feed each 25 pair binder group through the back row of holes in the wiring bracket in accordance with the big number and pair count indicated on the front of the distributing bracket. (Figure 6).

(c) Cut each binder group to a length of 12 to 15 inches below the bottom of the bracket to preserve the pair twist. Install a single wire tie near the end of the binder group.

(d) Select a pair and pull from the single wire tie. Pull the pair taut, to remove any slack and cut the pair from 6 to 8 inches below the bottom of the distributing bracket.

(e) Apply from four to six twists in the cable pair as close to the bottom of the wiring bracket as possible. This prevents splitting of the OUT pair.

(f) Repeat (d) and (e) for each pair of the binder group and using the top of the next

lower distributing bracket as a guide, cut all pairs of the group. This assures a uniform length for the binder group. (Figure 11).

(g) Secure the pairs in the binder group by wrapping with a single twist of wire to bind the group together.

(h) Repeat procedures outlined in (c) through (f) for the remaining binder groups. Pairs through the lower bracket should be cut to the same length as the other pairs.

(i) If a talk circuit is designated connect to the terminal block as described in part 12.

(j) For lengthening conductors in IN and OUT cables proceed as described in Part 13.

**7.05 Connecting in the QCH1C:**

(a) Select and cut the IN pair from the capped binder group.

(b) Pull out the selected IN cable pair from the binder group immediately above the binder group marker at the sheath opening. Do not remove the selected pair from the binder group marker at the sheath opening. This prevents loss of identity.

(c) Rerun the selected IN pair through the channelling rings in the space between the spare IN pairs and the connected IN pairs, to the appropriate splicing level. Care must be exercised to avoid tying in the pairs.

(d) Pull the IN cable pair taut to remove slack and cut to the same length as the binder group containing the OUT cable pair.

(e) Connect the IN cable pair to the OUT cable pair using B Wire Connectors. Do not remove the OUT pairs from the rear hole of the wiring bracket.

(f) Repeat (a) through (e) to connect any additional IN cable pairs to OUT cable pairs.

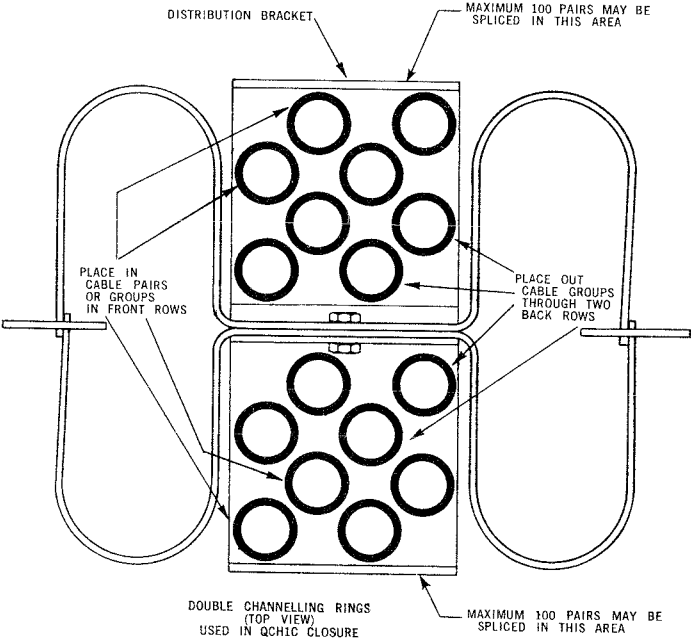
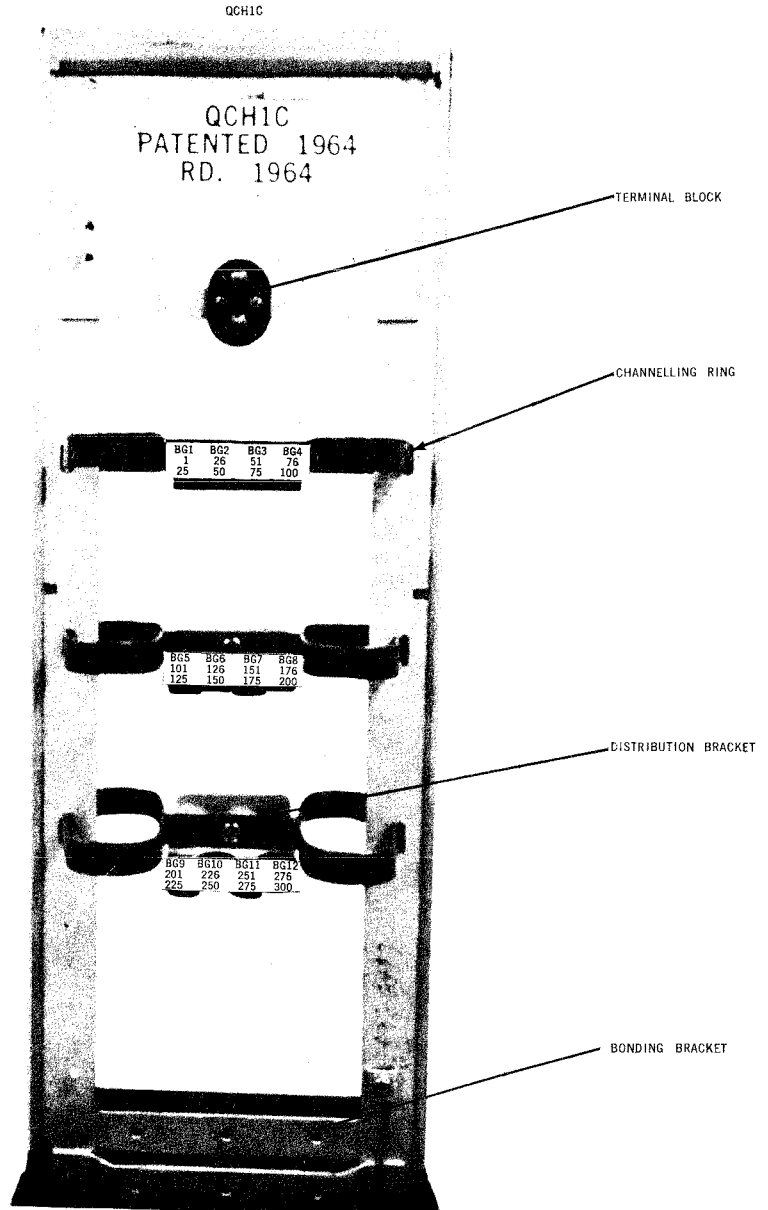
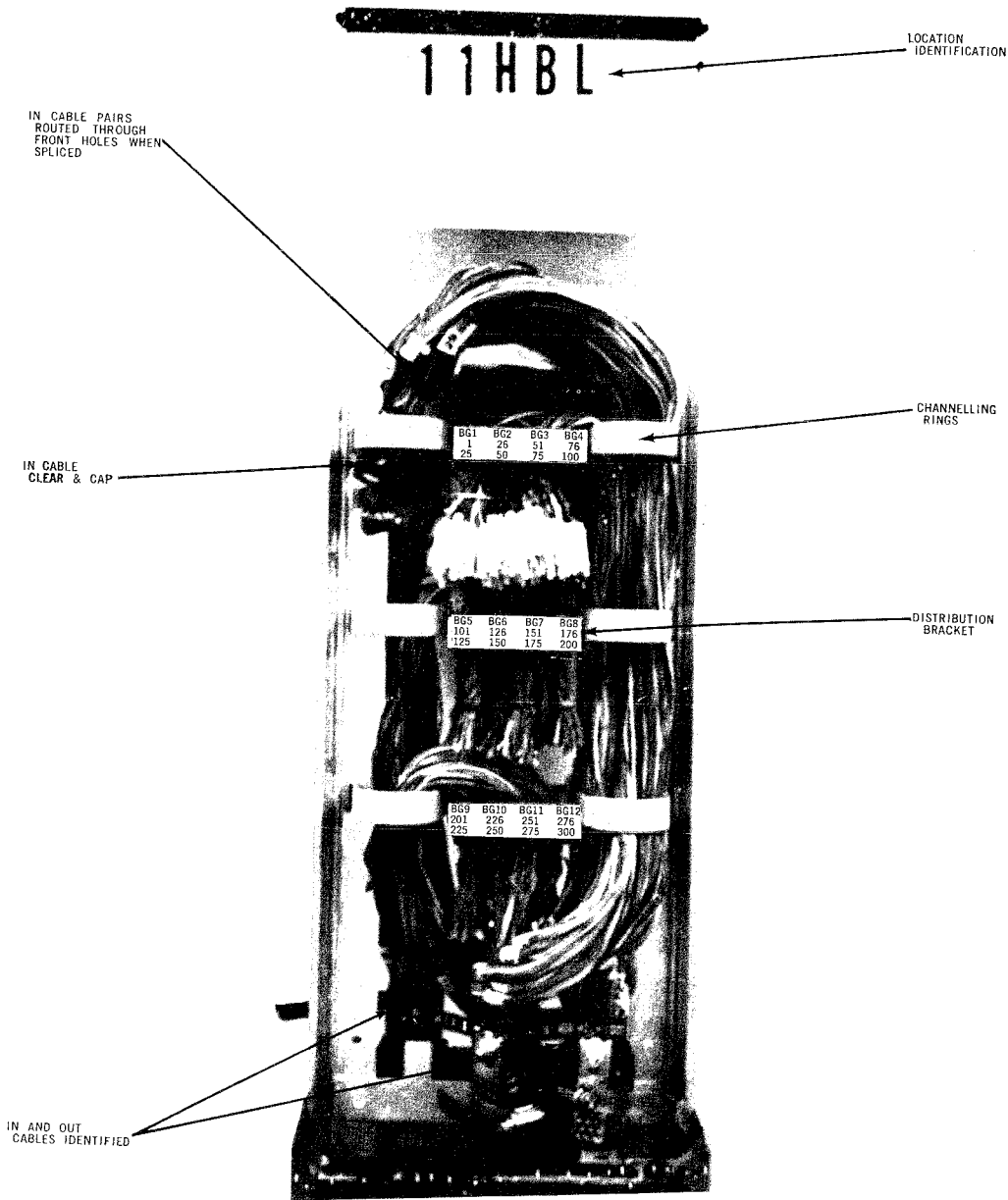


Fig. 6



QCH1C  
Fig. 7



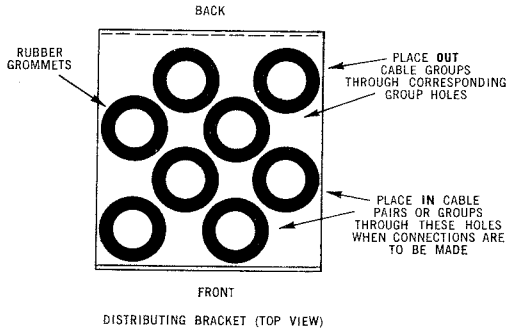
QCH1C  
Fig. 8

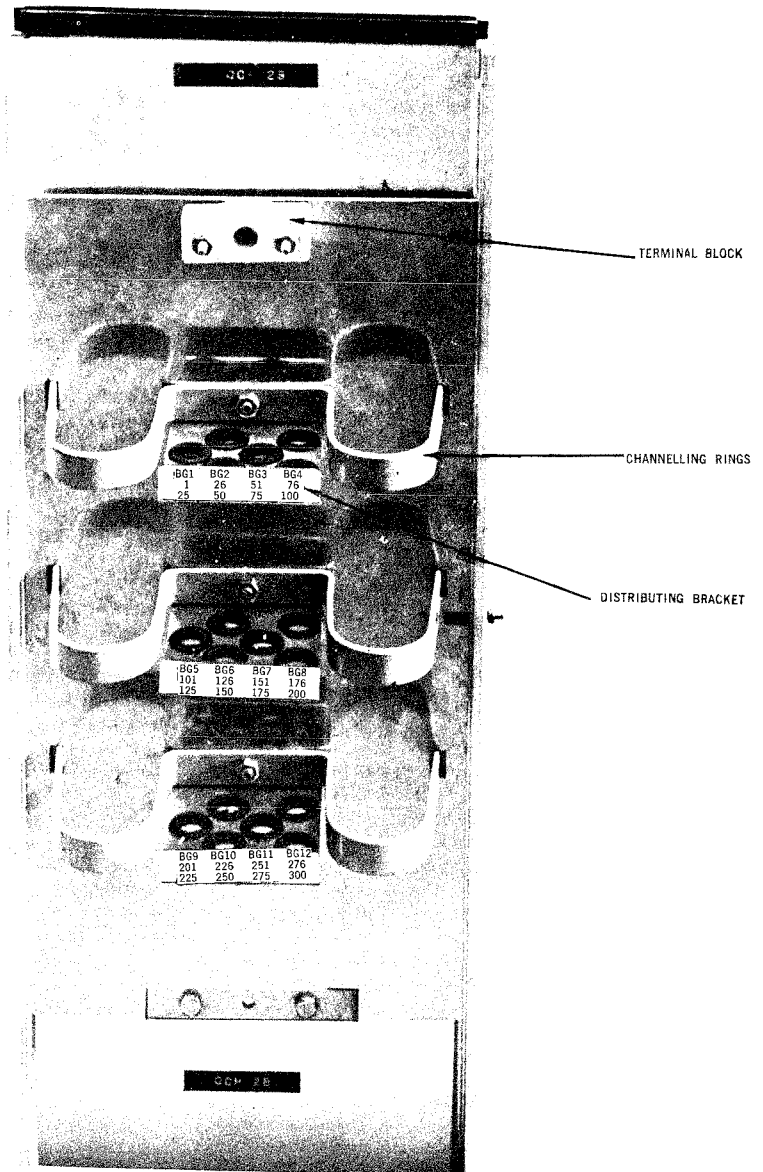
**8. WIRING AND CONNECTING THE QCH2C**

**8.01** The wiring and connection in the QCH2C closure which is used as an access point and may be used as a control point up to 300 "OUT" pairs is as described in Paras. 9.03 to 9.06.

**8.02** If a talk pair is designated connect to the terminal block as described in part 12.

**8.03** For lengthening conductors in IN and OUT cables proceed as described in part 13.

**Fig. 9**



QCH2C  
Fig. 10

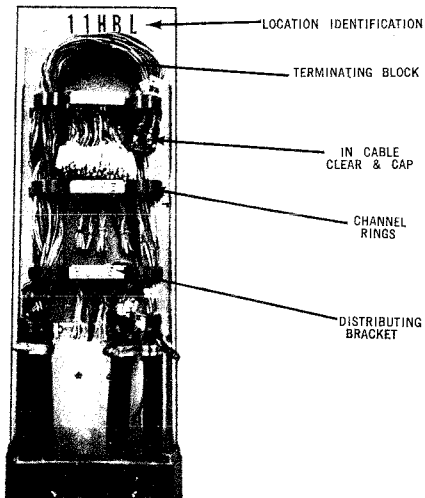


Fig. 11a

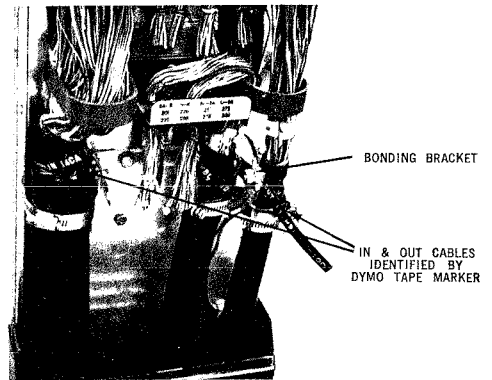


Fig. 11b

CUTTING THE 25-PAIR GROUP OF WIRES

Fig. 11

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### 9. WIRING AND CONNECTING THE QCH12B

**9.01** The wiring and connection in the QCH12B which may be used as a control or access point is as follows.

#### IN Cables

**9.02** Place the IN cable from the wire centre through the channelling rings on the left hand side as viewed from the front of the closure.

**9.03** Clear and cap the IN cable using a Plastic bag or Plastic Cap as outlined in Division 633 on Capping Cable Ends.

#### 9.04 OUT Cables:

(a) Route the OUT cable binder groups through the right hand channelling rings and lay across the top of the wiring brackets. The binder group colour codes must correspond to the colour code on the front of the distributing bracket.

(b) Feed each 25 pair binder group through the back row of holes in the wiring bracket in accordance with the B.G. number and pair count indicated on the front of the distributing bracket. (Figure 11).

(c) Cut each binder group to a length of 12 to 15 inches below the bottom of the bracket to preserve the pair twist. Install a single wire tie near the end of the binder group.

(d) Select a pair and pull from the single wire tie. Pull the pair taut, to remove any slack and cut the pair from 6 to 8 inches below the bottom of the distributing bracket.

(e) Apply from four to six twists in the cable pair as close to the bottom of the wiring bracket as possible. This prevents splitting of the OUT pair.

(f) Repeat (d) and (e) for each pair of the binder group and using the top of the next lower distributing bracket as a guide, cut all pairs of the group. This assures a uniform length for the binder group.

(g) Secure the pairs in the binder group by wrapping with a single twist of wire to bind the group together.

(h) Repeat procedures outlined in (c) through (f) for the remaining binder groups. Pairs through the lower bracket should be cut to the same length as the other pairs.

#### 9.05 Connecting in the QTC12B — 300 Out Pair Panel

(a) Select and cut the IN cable pair from the capped binder group.

(b) Pull out the selected IN cable pair from the binder group immediately above the binder group marker at the sheath opening. Do not remove the selected pair from the binder group marker at the sheath opening. This prevents loss of identity.

(c) Rerun the selected IN pair through the channelling rings in the space between the spare IN pairs and the connected IN pairs to the appropriate splicing level. Care must be exercised to avoid tying in the pairs.

(d) Pull the IN cable pair taut to remove slack and cut to the same length as the binder group containing the OUT cable pair.

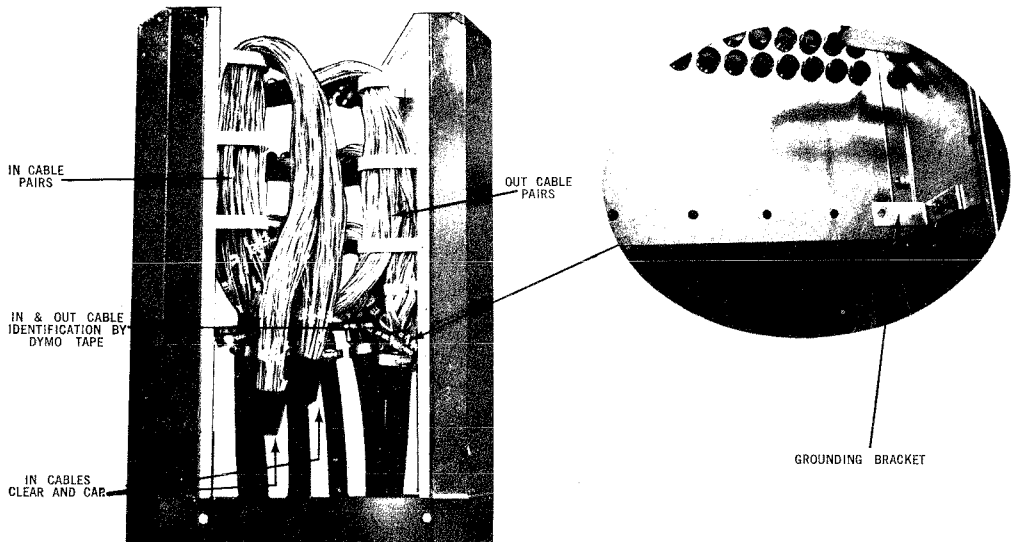


Fig. 12 — Cables Identified & Out Pairs in Place

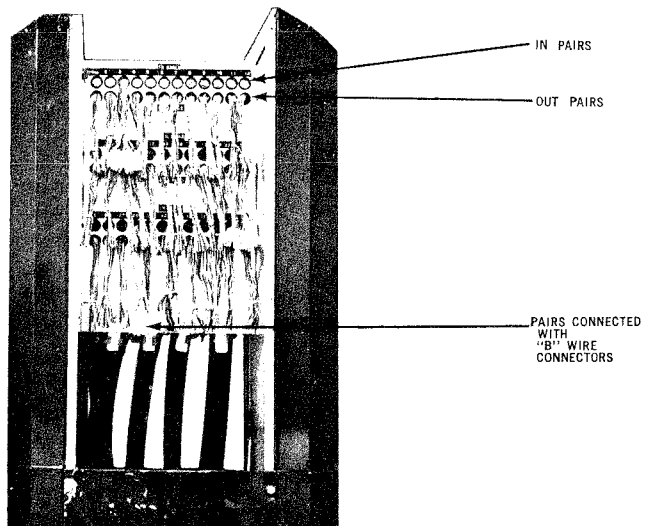


Fig. 13 — Front View Out & in Pairs Connected

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(e) Connect the IN cable pair to the OUT cable pair using B Wire Connectors. Do not remove the OUT pairs from the rear hole of the wiring bracket.

(f) Repeat (a) through (e) to connect any additional IN cable pairs to OUT cable pairs.

### 9.06 IN Cables

(a) Route the IN cable up through the channelling rings on the left side of the terminal as viewed from the rear. (See Fig. 12)

(b) Clear the IN pairs as per Part 6 of this section.

### 9.07 OUT Cables

(a) There are three, double rows of distributing grommets. Counting from the left to the right on the pair connecting side (front) of the Control Point, these three double rows of grommets are identified by B.G. numbers respectively from top to bottom. Each single row has a capacity of 300 pairs. (See Fig. 13)

(b) Route the OUT cable binder groups up through the right hand channelling rings as viewed from the rear. Each 300 pair count or portion thereof should be layed over the channelling ring adjacent to its respective row of grommets. (See Fig. 12)

(c) Feed each 25 pair binder group through the bottom holes of the double row of grommets in accordance with the pair counts indicated on the front side of the panel. (See Fig. 13)

(d) Cut each group to a length of 12 to 15 inches below the row of grommets it passes through, to preserve the pair twist. Install a single wire tie near the free end of the binder group.

(e) Select a pair and pull from the single wire tie. Pull the pair taut to remove any slack and cut the pair 6 to 8 inches below the grommet.

(f) Apply 4 to 6 twists in the cable pair as close to the grommet as possible. This prevents splitting of the OUT pairs.

(g) Repeat (e) and (f) for each pair of the binder group and using a mark  $\frac{1}{2}$  inch below the next lower double row of grommets as a guide, cut all the pairs of the group. This assures a uniform length for the binder group. (See Fig. 13)

(h) Secure the pairs in the binder group by wrapping a single twist of wire to bind the group together.

(i) Repeat procedures outlined in (c) through to (h) for the remaining binder groups. Pairs through the lowest row of grommets should be cut to the same length as the other pairs.

### 9.08 Connecting in the QTC12B (900 pair panel)

(a) Select and cut IN cable pair from the capped binder group.

(b) Pull out the selected IN cable pair from the binder group immediately above the binder group marker at the sheath opening. Do not remove the selected pair from the binder group marker at the sheath opening. This prevents loss of identity.

(c) Rerun the selected IN pair through the channelling rings in the space between the spare IN pairs and the connected IN pairs to the appropriate splicing level. Care must be exercised to avoid tying in the pairs. (See Fig. 12)

(d) Place the IN cable pair through the top hole of the double row of grommets corresponding to the OUT cable pair.

(e) Pull the IN cable pair taut to remove slack and cut to the same length as the binder group containing the OUT cable pair.

(f) Connect the IN cable pair to the OUT cable pair using B Wire Connectors. Do not remove the OUT pairs from the bottom grommet. (See Fig. 13)

(g) Repeat (a) through (f) to connect any additional IN cable pairs to OUT cable pairs.

**10. VERIFICATION OF PAIRS COMMITTED (C.P. TO A.P.)**

**10.01** At time of committing pairs through a control point to feed an access point ONE PAIR in each 25 pair group (committed in whole or part) shall be tested between the control point and access point to ensure pair continuity and correct binder group sequence.

**11. IDENTIFYING SPECIAL CIRCUITS**

**11.01** When cable pairs are used for special services, it will be necessary to identify the circuits by wrapping a warning marker tape around each B Wire Connector.

**12. TALKING CIRCUIT**

**12.01** If a talking circuit is designated connect to the terminal block as follows:

**12.02** Cut the assigned talk pair from the capped binder group.

**12.03** Strip the insulation from the ends of the talk pair and terminate by wrapping the wires around the binding post of the terminal block and tighten the nuts.

**13. LENGTHENING PAIRS****OUT Cable Pairs**

**13.01** If an OUT cable pair is too short, lengthen the conductors as follows:

(a) Obtain a length of wire having the same coloured insulation and gauge as the cable pair to be lengthened.

(b) Cut the ends of the OUT cable conductors and lengthened conductors square, insert a B Wire Connector and press.

(c) Route the lengthened wires through the distributing ring and place through the assigned rear hole of the wiring bracket and apply four to six tight twists to prevent pair splitting.

**IN Cable Pairs**

**13.02** IN cable pairs which have been disconnected from OUT pairs or cut from the cleared and capped end and are not to be used immediately must be cleared and dressed as described below:

(a) Lengthen the pair as described in Para. 13.01 ((a) and (b)).

(b) Route the wires through the distributing lines along with the remaining IN spare pairs of the same binder group.

(c) Cut the pair the same length as the rest of the IN spare pairs.

(d) Clear the ends of the pair by placing a "B" Wire Connector on each wire.

(e) Tape the wires to their respective binder group, near the cleared end of the IN pair stub.