NEW ZEALAND POST OFFICE

INSTALLATION SPECIFICATION No. 1130
CONCERNING GENERAL ASPECTS OF
INSTALLATION OF UAX N.Z. 13

ENGINEER-IN-CHIEF'S OFFICE
GENERAL POST OFFICE
WELLINGTON

(FOR OFFICIAL USE ONLY)

INDEX

SECTION 1 - GENERAL

1.1 GENERAL

1.1.1 This specification covers the general aspects of UAX installation and supersedes I.S. 1078 for future work. A separate I.S. number has been given to this specification in preference to making a further issue of I.S. 1078. In this way I.S. 1078 may still be applied where necessary to the cabling arrangements at extensions to UAX's installed to the earlier standards.

1.1.2 Specification I.S. 1078 is now out of date due to changes in installation practice, changes in equipment consequent on policy changes such as extended area calling, and equipment modifications as a result of in-service experience. This specification takes account of these changes.

1.1.3 Addenda will be issued to take account of future changes in equipment and installation practice.

1.2 REFERENCES

1.2.1 General

Basis of Design UAX N.Z. 13, ER/TP 1048
Basis of Provision UAX N.Z. 13, ER/TP 1054
Typical Cabling, Jumpering and Trunking Arrangements UAX N.Z. 13, GBW 15780 (This drawing supersedes both GEC 7005419 and ATE 433846)
Rack Common Services GBW 13730, GBW 13700 (R Unit) and NZPO 33739 (RM Unit)
Allocation Instructions, Number Allocation Chart UAX N.Z. 13, NZPO 24593

1.2.2 NZPO Engineering Instructions

(a) Installation

TELES Gen A 3011	-	Telephone exchange equipment, installation.
TELES Gen M 3503	-	Telephone exchanges, provision of furniture and fittings.
TELES Gen P 0151	-	Distribution frames, fuse mountings.
TELES Gen P 0161	-	Distribution frames, protector mountings.
TELES Gen P 0211	-	Distribution frames, cross connecting and jumpering.
TELES Gen T 3011	-	Tools and plant for installation of exchange equipment.
TELES Gen W 3021	-	Switchboard cables, installation and terminations.
TELES Gen W 3023	-	Soldering of switchboard cables and wires.
TELES Auto A 5480	-	RAX's and UAX's, specialised spare parts.
TELES Auto A 5490	-	RAX's and UAX's, uniselector replacement with BPO No. 2 type.
TELES Auto H 3170	-	UAX N.Z. 13, jumpering for new connections and subscribers' number changes.

(b) Installation Testing

TELES Auto H 3051	-	Type No. 13 UAX's installation testing.
TELES Auto H 3151	-	UAX N.Z. 13R, installation testing.
LINES Cable M 1000	-	Acceptance testing of trunk and junction circuits.

(c) Adjustment and Inspection

TELES Auto B 5017	-	Master Clocks, periodical inspection.
TELES Auto B 5051	-	Lubrication of switching equipment.
TELES Auto B 5061	-	Two-motion selectors, 2000 type.
TELES Auto B 5065	-	Meters, 100-type, adjustments and requirements.
TELES Auto B 5182	-	Uniselectors, BPO type No. 2.
TELES Gen F 5041	-	3000-type relays.
TELES Gen F 5053	-	Thermal relays, 3000-type.
TELES Gen F 5055	-	Ringing and tone vibrators, adjustments and requirements.

(d) Visual Inspections

TELES Auto B 5304	-	Two-motion selectors, 2000-type.
TELES Auto B 5306	-	Two-motion selectors, bank contact cleaning.
TELES Auto B 5308	-	Selectors wipers and cords, inspection.
TELES Auto B 5188	-	Uniselectors, BPO No. 2.
TELES Gen F 5011	-	Relays, inspection.

(e) Testing

TELES Auto B 5517	-	Master Clocks, types Nos. 36 and 46, functional tests.
TELES Auto H 5021	-	UAX's, maintenance routines.
TELES Auto H 5031	-	UAX's, functional tests.
TELES Auto H 5505	-	UAX N.Z. 13, test of revertive call relay sets.
TELES Auto H 5511	-	UAX systems, testing of ringing and tones equipment.
TELES Auto H 5520	-	UAX N.Z. 13, test of subscribers' meters.

(f) Acceptance Testing

TELES Gen Z 3010	-	Acceptance testing and inspection.

(g) Power Plant

POWER Gen F 1401	-	UAX's, power equipment provision.
POWER Gen F 3401	-	UAX's, power equipment installation.
POWER Bldg Svs B 3043	-	RAX's and UAX's, prevention of moisture deposition.

1.3 ENCLOSURES

Appendix No.1	Cabling schedule.
Appendix No.2	Cable Cross Sections.
Sketch A	Equipment Layout.
Sketch B	Cabling of Final Selector Routine Test Numbers.
Sketch C	Cabling of Group Selector Levels 0 and 1.
Sketch D	New Layout of G/S Level Terminations on C-Unit IDF.
Sketch E	Addition of Fourth Fuse Panel in 'B'-Unit.

SECTION 2 - INSTALLATION

2.1 PREWIRING

2.1.1 Considerable economy in travelling and accommodation expenses can be achieved in the installation of UAX systems remote from a technician centre by the partial or complete prewiring of units, or the complete installation of the equipment in the building before transportation to site.

2.1.2 While whole suites may be prewired, experience has shown that the prewiring of units AI and C1 only is preferable unless specialised equipment is available to handle the larger bulk of more than two units.

2.1.3 The complete installation of the equipment in the building before transporting to site is the better approach and has the obvious advantage that less work is required on site before commissioning the system. Transportation is usually no problem as there are now a number of firms throughout New Zealand which specialise in house and small building removals.

2.2 LOCATION OF UNITS

2.2.1 The units are to be placed in the position shown on the floor plan.

2.2.2 In order to exclude dust from the equipment during installation the unit covers are to be retained in place and removed only when necessary.

2.3 ASSEMBLY OF THE C AND A UNITS (FIRST SUITE)

2.3.1 Place the C Unit over the cable entry as shown on the floor plan. The cover for the cable hole located at the top of the Unit (right hand side viewed from the front) is to be removed and put aside so that it can later be used to seal the open cable hole of the last Unit of the suite.

2.3.2 Line up the first A Unit with the C Unit and, at the same time, place the wood gasket in the holes of the two units (see Sketch A, Fig. 1). Place the wood packing piece between the bases of the two units so that it rests on the floor when the units are bolted together, and the small steel spacer block between the units on the top centre bolt. The A unit is to be secured to the C Unit with 7 bolts (supplied with the A Unit) , two (5/16" x 1½") which pass through the bases of the two units, one (5/16" x 2½") through the hole near the cable holes, and the remaining four (¼" x 2¾") through the cable holes to ensure a good joint between the wooden gasket and the fabric covered rubber cord lining the edges of the two cable holes. Tighten the bolts evenly to prevent distortion. The small wood block provided is to be placed at the bottom of the aperture to prevent chafing of the inter-unit cables. (see Sketch A, Fig. 3).

NOTE. On earlier supplies of units, the hole adjacent to the cable hole is tapped and a 5/16" x 2" bolt provided for fixing. This hole should be drilled clear to 3/8" diameter and a 5/16" x 2½" bolt and nut used for fixing.

2.3.3 The same procedure is followed for the addition of the other units; the hardwood cover removed from the C Unit being placed in the right-hand cable hole of the last unit and the adjacent hole sealed by the 5/16" x 1" bolt supplied with the C unit. (See Sketch A, Fig. 2).

NOTE. On earlier supplies of C Units, a 5/16" x 5/8" bolt was provided; this is to be changed for a bolt of the correct size.

2.3.4 Where a M, B, S or E Unit is required to be installed in the suite, it is assembled in a similar manner to that outlined above for the A Units.

2.4 ASSEMBLY OF A SECOND SUITE

2.4,1 This suite may contain A, B, E, M or S Units all of which are assembled in a similar manner to that outlined above, but, in addition, an external cable trough is provided for the cabling between this suite and the C Units.

2.4.2 To fit the trough, first remove the hardwood cover of the cable hole in the front of the C Unit. Next, fit the bracket supplied for supporting the trough at the first unit of the second suite by removing the four wood screws covering the bracket fixing holes on the right-hand side (viewed from the front) of the unit, and secure the bracket with the four No. 10 round-head 1¼" wood screws. Fix the wood packing to the top of the bracket with two No. 6 round head ⅝" wood screws. Use one of the ⅝" x 1" bolts and nuts supplied with the C Unit to seal the bolt hole. The trough is then placed in position and the joints between the ends of the trough and the units made in a manner similar: to that described in para. 2.3.2.

2.4.3 The hardwood cover removed from the cable hole in the front of the C Unit is fitted to the left-hand cable hole of the end unit of the suite as in Sketch A, Fig. 2. The cover for the open end of the trough is secured in position, but the bracket below this cover is reversed so that it will not project beyond the end of the trough.

2.5 ASSEMBLY OF A THIRD SUITE

2.5.1 This is assembled in a similar manner to the second suite with the exception that the cable trough to the C Units is made up of two cable trough sections joined end to end.

2.6 LOCALLY MANUFACTURED TROUGHING

2.6.1 For some installations the floor plan will show that a locally supplied or manufactured trough will be required. This can in fact be either a totally enclosed trough, an open trough or a cable runway. The main consideration is that the inside of the units are satisfactorily sealed from the outside air. This may be accomplished by using :-

(1) sealing compound and painted hardboard suitably cut to fit -

(a) troughing that is smaller than the unit cable exit and entrance

(b) open troughing

(c) cable runway

(2) A rubber gasket cut to fit an enclosed trough that is larger than the unit cable exit and entrances.

2.7. INSTALLATION OF THE SECOND AND SUBSEQUENT C UNITS

2.7.1 Where a second or third C Unit is required it is to be installed as shown on the floor plan, and joined to the existing C Unit in the following way :-

(a) Substitute the closed end panel of the second and subsequent units by an open wooden framework JB 707;

(b) fit wooden gaskets between the openings in the wooden framework and those in the end of the preceding C Unit when the doors are removed; and

(c) remove the bolts and wingnuts from the end of all C Units except the last so that the units may be bolted together.

2.7.2 The detailed modifications to be made to a second or third C Unit are as follows:-

(a) Remove the door panels and horizontal supports from front and rear of unit.

(b) Remove the five wood screws securing the roof to the closed end panel. (These screws are required later to secure the wooden framework).

(c) Remove three 2BA screws from the right-hand side of the fixed top panel which has the cable-trough aperture. (These screws engage in tapped holes in the mild steel plate joining the fixed panel to the closed end panel).

(d) Remove the 2BA screws and nuts from the top and bottom of the uprights of the closed end panel (four screws and three nuts).

(e) Remove two countersunk 2BA screws from the left-hand side of the cable hole framing on the closed end panel.

(f) Starting with the lowest, remove the five 5⁄16" bolts and nuts which secure the closed end panel to the rack upright. The panel can now be removed, with the mild steel plate (for fixing to the fixed panel) and the brackets (which normally support the front and rear centre rails still attached to it.

(g) Drill out the 3⁄8" tapped hole (situated about 5½" from top of the upright) to give a 3⁄8" clear hole.

(h) Remove the two wooden gaskets and protective battens from the top and bottom of the wooden framework; the battens are nailed on and are to be knocked off, not levered off.

(i) Place the wooden framework in position on the unit and secure the top and bottom of the uprights to the top and bottom of the unit by means of the four 1½" round-head No. 8 wood screws and washers provided. It will be found that the framework overhangs the footing by about ¼"; this is in order. Secure the top of the unit to the top rail of the framework by means of the five wood screws removed under (b). Secure the front fixed panel to the wooden framework by three 2" round-head No. 8 wood screws which are passed through the holes vacated by three 2BA screws removed under (c), and screwed into the block at the top of the upright.

(j) From the uprights of the closed end panel, detach the rubber seatings together with the mild steel angle strips which retain them in position, by removing the wood fixing screws. Refix the rubber seatings and angle strips in the corresponding positions on the uprights of the wooden framework.

(k) Fill the small gaps between the top of each upright of the wooden framework and the top of the unit with compound, S.L. No. P 338.

2.7.3 The detailed modifications to the open end panel of the first C Unit (and subsequent units as required) are as follows:-

(a) Remove the two door panels from the end of the unit.

(b) Where the unit is in service, remove the service telephone and bracket, and fill the fixing holes and wiring holes with compound S.L. No. P 338. (Provide temporary wiring for the telephone through the front of the unit).

(c) Remove the press-button, and, if the unit is in service, suspend it inside the unit and re-connect the wiring. Fill the fixing and wiring holes with compound S.L. No. P 338.

(d) Remove the eight ¼" bolts and wingnuts holding the door panels.

(e) Drill two 7/16" holes in the channel-iron footing at this end of the unit to correspond with the two similar holes now showing in the footing below the wooden framework on the second and subsequent C Units.

(f) Drill four ⅜" holes in the rack upright of the unit to correspond with the four similar holes now showing in the rack upright of the second and subsequent units. (Ease the main wiring form slightly out of position and protect it while drilling the holes in the top half of the upright).

(g) Drill and tap holes in the rack upright to fit jumper rings as required.

2.7.4 When these modifications have been carried out the C Units are placed in position with the wooden gaskets in the openings between them. These gaskets are fitted with the rubber strip side towards the end C Unit. The units are to be bolted together in the following sequence:-

(a) by two 2" x ⅜" bolts and nuts between the rack footing;

(b) by four 3½" x 5/16" bolts and nuts between the two rack uprights, the heads of the bolts to be pointing away from the end C Unit; and

(c) by seven 4½" x ¼" bolts and nuts between the uprights of the C Units. (These bolts and nuts are not to be over-tightened, as damage to the wooden framework may result.)

The horizontal supports and door panels are now replaced on the second and subsequent units.

2.7.5 The service telephone is to be re-mounted on the end unit. The press button is to be removed from the first C Unit and refixed by the means of wood screws to the adjacent rack uprights on the front left-hand end of the second C Unit. The wires from the supervisory lamp panels are to be commoned and connected to one terminal of the press button. Connect the negative lead from the first C Unit to the other terminal. Insulate and secure the negative leads from the second and subsequent units.

2.8 INSTALLATION OF AN ATTACHED R UNIT

2.8.1 Provision has not been made in the cabinet construction for joining the A and R Units in the manner described in para. 2.3.2.

2.8.2 The R Unit is to be so placed that it can be joined to an A or B Unit by three 5/16" x 2½" bolts through the rack uprights. For this purpose existing bolt holes at the top, midway, and bottom of the A or B Unit are to be used and the R Unit drilled accordingly.

2.8.3 A suitable wooden gasket, generally similar to that used between A. Units, is to be constructed to permit cable access between the two units.

2.9 TIE-BARS

2.9.1 When all units have been finally placed in position, the suites are to be braced to the wall of the building by means of tie-bars.

2.9.2 A 1½" x 1½" x ¼" mild steel angle (S.L. No. RF 370) is to be suitably fixed to the wall at a height of 8 ft 3¼ in from the floor and tie-bars of 1½" x ½" flat mild steel (S.L. No. RF 206) are fixed between the angle iron and the suites as shown on the standard Floor plans NZPO Drwg Nos. 22961 and 22962. Secure the bars to the units by the fixings provided and to the angle iron by ¼" diameter bolts.

2.9.3 It will be found that tie-bar fixings on the suite A5-A8 do not exactly line up with those on the other suites and, as the location of the suite is determined by the position of the cable trough on Unit A5, it will be necessary to give the tie-bars a slight set between the second and third suites.

2.9.4 In some cases UAX equipment is installed in a non-standard UAX building - e.g., Post Office, and some considerable difficulty could be experienced in fitting tie bars from the units to an adjacent wall. It is considered that if the units are securely bolted to the floor and tie bars are used between suites this together with the suite cable troughing should give sufficient rigidity without the necessity of extending the tie bars to a wall of the building.

2.10 TUBULAR HEATERS

2.10.1 Tubular heaters are to be installed in UAX Units at an installation where high relative humidity conditions exist. The method of installing tubular heaters is fully covered in POWER Building Services B 3043.

2.11 INSTALLATION OF LINE CIRCUITS 51 TO 60 IN AN A UNIT

2.11.1 These line circuits are mounted horizontally on two locally manufactured brackets fitted to the angle iron at the bottom of the A Unit and are used to terminate M Unit lines. For dimensions of brackets and method of installation see sheet 1 of NZPO drawing 34013.
Note. This drawing supersedes NZPO 30893.

2.11.2 If a tubular heater is fitted and causes interference it should be relocated clear of both the relay set and any associated wiring.

2.11.3 The line circuits are to be terminated on the C Unit IDF in accordance with Fig. 4,of NZPO drawing 34013.

2.11.4 Wiring is to be in accordance with GBW 13910 MOD A and N.Z. Note A of GBW 13730 will also apply. The details of changes to these standard GBW circuits are as follows:-

(a) Additional Components

Mount 1/6 AZ rectifier (MR 5) on top of MR 1 & 2 of GBW 13910, Fig. 8.

(b) Wiring changes

Shift G-W from MR2b to MR5a
Remove G-W from IRKT5 to Vert Mkg. Strip Conn., Tag Lev. 1 of' LF1 &. 2 Rear, and coil up both ends.
Run G-W from Vert Mkg, Strip Conn., Tag Lev. 1 of LF 1 & 2 Rear, to MR5a.
Strap MR2b to MR5b
Run O-G from LS 22 of line cct. 51 to Vert Mkg. Strip Conn., Tag Lev. 0 of LF 1 & 2 Front.
Run G from LS 1 of line cct 51 to OKRT 2.
Run R-W from LS 2 of line cct 51 to R8a.
Run R-W from K 21 of line cct 51 to Misc Strip Conn., PG ALM (See GBW 13730, Fig.. 3B)
Run 22 swg R & V pair from ETH & BATT tags on level '6' line relay plate to ETH & BATT tags on level '0' line relay plate.

(c) Cabling

Run 51w uncovered cable from level '0' of Line Finder Strip Conn. to line cots 51-60 and wire as follows:-

	Cct 51	
Line Fndr Strip Conn		Line Relays
M	BL	LS3
P	RD	P4
P1	WH	LS21
-	BL	K2
+	WH	K3

Run 31w cable from level '0' of Line Finder Strip Conn. to appropriate terminal strip on the C Unit IDF. as shown on NZPO 34013, Fig. 4.

2.11.5 All wiring is to approach the level '0' line relay set from the R.H.S. of the A Unit looking from the rear. The form is to be 'S' shaped to allow the relay set to be removed from the mounting brackets if required for maintenance purposes.

2.11.6 Re-designation and additional designations will be required as follows:-

(a) Local side of IDF as per NZPO 34013 Fig. 4

(b) A Unit fuse mounting as per NZPO 34013 Fig. 5

(c) Line relay set as per NZPO 34013 Fig. 2

2.11.7 As these line circuits are only to be used to terminate M Unit lines the installation of subscribers meters will not be required.

2.12 INSTALLATION OF SELECTOR SHELVES IN A B UNIT

2.12.1 To mount a selector shelf in a B Unit it will be necessary to use locally made brackets (ref. NZPO Drwg. 34269) to allow the shelf mounting channel to be in direct contact with the face of the angle iron of the unit framework. This will ensure adequate clearance between the selector test jack links and the unit cover.

2.12.2 A 10 x 2 BPO No. F 151/20AH relay mounting plate, equipped with the release alarm circuit, is to be installed and wired as per Fig. 2A of GBW 13730 to both the selector U-points and the Misc. T/S in the B Unit (use spare terminals immediately below FA terminals). See Typical Equipment of UAX N.Z. 13 E Unit (ATE Drwg. No. 495266) for layout of relay plate.

2.12.3 Other common services required are NU tone (Fig. 10B) O/F Busy tone (Fig. 15B) , + ve battery (Fig. 25A) and time pulses (Fig. 16E). The terminal to be used for the time pulse TPR lead on the B Unit Misc. T/S is the front one on the bottom row. The Misc. T/S should be suitably re-designated.

2.12.4 A separate 6W, 20 swg. cable is to be run from the Misc. T/S in the B Unit to the C Unit for the Release alarm and the Time pulse (TPR lead for group selectors) circuits.

2.12.5 On all working levels it is necessary to have an overflow meter connected to the 11th step. When the B Unit group selectors have access to the same selectors as the A Units run a 12w cable from the G/S bank mult. T/S in the B Unit to the G/S bank mult T/S's in the nearest A Unit. If they do not have access to the same selector4overflow meters are to be equipped as required in the A1 Unit and cabled accordingly.

2.12.6 Should Fig. 2 or 3 of GBW 15960 be required the resistors are to be mounted on the 10 x 2 relay plate provided for the release alarm circuit (see par. 2.12.2).

2.12.7 Other cabling is as shown on GBW 15780, Fig. 15.

2.13. ALLOCATIONS AND CONNECTION OF SUBSCRIBERS

2.13.1 Subscribers' Circuits. These will be allocated in accordance with NZPO drawing No. 24593, sheets 12 & 13, "Number Allocation Chart UAX N.Z. 13 Allocation Instructions" and will usually fall in the number range 300-899. Number 810 is used for the service telephone and numbers 811, 611 and 411 are used as fault numbers and will not be allocated to subscribers. In addition. numbers 710, 711, 610, 510, 511, 410, 310 and 311 will be reserved as long as possible for use as routine test numbers.

2.13.2 CCB & SCB Lines. In order to cater for these lines, level 2 of the line finder is commoned to level 3 so that the 10 subscribers' line circuits associated with these levels may be used for coin-box, multi-party or regular subscribers' lines. Discrimination is controlled by the appropriate strapping of connections on the L/F bark terminal strip as covered by Note 6 on drawing GBW 13910.

2.13.3 PBX Lines. Where PBX final selectors are equipped PBX stepping can be applied to a group of subscribers' lines by strapping the P2 tag of the first line of the group to the R9 tag, and the last line of the group to the ETH tag on the final selector connection strip. Each line must be similarly strapped in both A Units of the 100's group, as the P2 wires are not multipled between units. The P2 tags of lines 11 and 12 are wired to tags on the final selector routine test connection strip instead of to the regular P2 tags and in the event of these lines being used for PBX working, the required strapping must be applied at the F/S ROUTE TEST tags. Where lines 710, 510 or 310 are the last lines of a PBX group, the earth should not be strapped to the P2 tag.

2.13.4 Spare Numbers. The -, + and P tags of all spare numbers on each final selector group multiple are to be commoned on the final selector multiple connection strips and jumpered to the NU TONE tags on the local side of the IDF, verticals 4 and 5.

2.13.5 Service Telephone. The telephone is to be secured to the shelf by means of the clip provided. Use a short length of twin wire to connect it to the L1 and L2 terminals of the line testing equipment. Pass the wires through the insulated break provided and the space is then filled with compound. Run a jumper from the terminals - and + on the line testing equipment to the 810 line on the multiple side of the IDF.

2.13.6 Line Relays for Level 4. These relays are not equipped initially, and if required, are to be wired similar to the level 7 relays (see GBW 13910).

2.13.7 Faulty and Temporary O.O.S. Lines. Tone jacks for the distribution of NU tone on these lines are provided on the MDF and cords supplied for connecting to the subscribers' MDF springs.

2.13.8 Fault Test Numbers. The fault test circuits are allocated to numbers 811 , 611 and 411, and are permanently wired on the appropriate C Units. These numbers are not jumpered in the C Units between the line finder and final selector terminal strips.

2.13.9 Routine Test Numbers. These numbers are to be reserved as long as possible for routine test purposes and are to be cabled as shown in Sketch B.

2.14 JUNCTIONS

2.14.1 Incoming Junctions. These are to be distributed over the line finder groups of the exchange as shown on sheet 2 of the Trunking and Equipment Diagram. Each L/F group will accommodate up to 10 junctions appearing on both levels 9 and 8 which with the exception of the "P" wires, are commoned, each level being connected to a different control set. Normally, the odd numbered junctions call on level 9, using the No. 1 control set, and the even-numbered junctions on level 8 using the No. 2 control set. If the normal control set has been "locked-out" or is engaged when the call originates, the switching relays in the incoming junction relay-set transfer it to the alternative control set.

2.14.2 Outgoing Junctions to Parent Exchange. For G/S VMB strapping and gradings of O/G junction levels refer to sheet 2 of the Trunking and Equipment Diagram.

2.14.3 Junction Relay Sets. These are mounted in the B Units, each circuit having its own terminal strip at the rear of the mounting plate. Cabling from these to the terminations on the IDF will vary according to the installation, and a standard layout of these cables in the cable trough cannot be established. The cabling of the various junction relay sets is shown on GBW 15780.

2.14.4 Subscriber Dialling

(a) Subscriber-dialled junction calls will be permitted according to local requirements. Multi-party subscribers and/or CCB's may be barred access on some or all routes, and in these cases connections will be obtained via the parent ".exchange operator by dialling '0'.

(b) A relay set strapping chart (an additional sheet to the Trunking and Equipment Diagram) will be supplied for each metering UAX. This chart will show the dialling codes permitted and the appropriate meter registrations.

2.15 INSTALLATION OF RELAY SET SHELVES IN A B UNIT

2.15.1 Shelf JB265 is to be used when jacked in relay sets are to be equipped in a B-Unit. Terminal strips and shelf jacks are to be fitted as required.

2.15.2 Wiring and the provision of common services is to be determined locally and will be in accordance with the type of relay set to be used.

SECTION 3 - CABLING

3.1 CABLING FROM C TO A UNITS

3.1.1 The cabling is to be provided as shown in Appendix 1 "Cabling Schedule" and on the typical cabling, jumpering and trunking drawing GBW 15780. The cable layout drawings GEC 700545 and ATE 433847 for Units A and C are now out-of-date and are not to be used for future work. Since the introduction of UAX's in N.Z. changes in policy - e.g., the adoption of extended flat-rate tariff areas, necessitated the installation of additional and new types of equipment. This has meant an increase in quantity of cable installed and also changes in floor layouts. Whereas B Units were originally installed in a separate row it is now common to install them on the end or at the beginning of an A Unit suite. When B Units, etc., are installed in this manner the cabling from these units is to be run above or below the cabling from the A Units. The critical place in the cable trough in regard to available cross-sectional area is between the first A Unit of a suite and its associated C Unit. The layout of cables between the C Units and A Units is to be in accordance with Appendix No. 2 of this Specification. Two points to consider when cabling are:-

(a) that sufficient room is left inside the various units, in the cable troughs and on the C Unit IDF's for future extensions, and

(b) cabling on the C Unit IDF is not to interfere with the area used for jumpering.

3.1.2 Attention is drawn to the "10" and "11" lines in each 100-line group. Terminate the "11" P-wire and the "10" -, + and P-wires from the IDF on the F/S multiple connection strip of the first A Unit of the group on the lower set of tags marked "F.S. Routine Test" (see GEC 700351, Fig. 11, or ATE 494063, Fig. 11). Multiple these connections to the second A Unit of the group by using the lower set of tags on each Unit, not by the means of the ordinary multiple connections (see Sketch B).

3.1.3 Line finder and final selector multiple cabling is to be fully installed.

3.1.4 Group selector multiple cabling is to be provided as follows:-

(a) Units AI to A4 installed initially - cable levels 9, 8, 7, 6, 1 and 0

(b) Units AI to A8 installed initially - cable levels 9, 8, 7, 6, 5, 4, 1 and 0

(c) Units AI to A12 installed initially - cable all levels.

NOTES

1 For cabling purposes levels 9/8, 7/6, 5/4 3/2 and 1/0 are paired.

2. In (a) above the group selector levels are to be cabled to the C Unit regardless of the number of units installed initially.

3. In (a) and (b) above it may be necessary to cable one or more of the other levels should it be desired to use these levels for an O/G junction route or an R or M Unit.

4. Should any other unit be installed adjacent to A4 all group selector levels are to be cabled between C1 and AI to avoid possible difficulties at a later extension.

5. Levels 0 and 1 have in the past been cabled on a combined basis (i.e., -, +, P, M1 and M0). For all future work levels 0 and 1 are to be cabled separately. The -, + and P company straps between levels 0 and 1 on the group selector multiple terminal strips must be removed.

6. All group selector levels except levels 0 and 1 are to be cabled between C Units. Levels 0 and 1 are to be jumpered.

3.2 CABLING INTO A UNITS

3.2.1 Two holes for the entry of cables into the A Unit are provided in the base of each sealed cable compartment. The wood battens which seal these holes are to be removed, by withdrawing the wood screws, and discarded. Feed the cables from the C and adjacent A Units into the unit via the cable holes and lace to the cable supports fitted to the rack verticals.

3.3 COMMON SERVICES

3.3.1 The cabling of alarms, tones, etc., from the C to B Units is shown in Appendix No. 1, but, because of the variety of circuits used, the connection of common services within the B Unit itself has been omitted. These, however, are clearly shown on drawing GBW 13730.

3.4 LEVELS 0 AND 1

3.4.1 As stated in para. 3.1.4 Note 5, group selector levels 0 and 1 are to be cabled separately to the associated C Unit and graded on the bank multiple terminal strip in the first A Unit of each suite. The jumpering to the junction relay sets is to be from the terminations in the C Units. (See Sketches C and D attached.)

3.5 TERMINATION OF CABLES

3.5.1 The tags on the multiple strip connections in the A Unit have three notches. Local wiring is connected to the notch nearest the base of the and the IDF and inter-unit cables terminate on the middle and outer notches respectively. Figs. 6 and 7 on Sketch A show the positions of the cables on the shelves.

3.5.2 The IDF and inter-unit cables terminate on the outer notches of the connection strips on the junction relay sets.

3.5.3 IDF. On the multiple side of the IDF the cable skinners are to be terminated on the left-hand side of the terminal strips, viewed from the front of the unit. On the local side the cable skinners are to be terminated on the right-hand side of the terminal strip viewed from the rear of the unit. Do not split cables between the two sides of the IDF.

3.5.4 Multi-party Subscribers' Lines. C Units are supplied equipped with one junction protector mounting (junctions 1-20) and cabling for a second (junctions 21-40). As 20 junction circuits per C Unit will rarely be exceeded the second protector mounting may be-fitted on site and used for :-

(a) terminating lines served by Unit 13R - a 20 x 3 cable is to be run from the protector strip to the R Unit.

(b) terminating lines served by Unit 13M - a 20 x 3 cable is to be run from the protector strip to vertical 4, of the IDF.

(c) terminating M or R relay sets - use the existing cable to the IDF. and re-designate.

3.5.5 Where the one additional protector mounting is inadequate, instructions will be issued in the Project Specification. At installations having two or more C Units, the junction protector mountings in the additional C Units can be utilised as in para. 3.5.4 above if not required for terminating junctions.

3.6 POWER CABLES Ref. NZPO. 29314 and E.I. POWER Gen F.1401.

3.6.1 When running power cables three factors should be taken into account :-

(a) the possibility of damage due to cleaning of floors,

(b) vandalism when cables are run under floors accessible from the outside of the building, etc.,

(c) neatness.

It is suggested that where cleating direct to a wall or under the floor is not satisfactory, the cable be run in one of the following :-

(a) wooden cap and casing,

(b) plastic troughing,

(c) metal troughing.

3.6.2 Wherever possible the cable for the 50V negative battery supply from the power panel to the C Unit is to be run under the floor, up through the bottom of the first C Unit and terminated on the "SUPPLY" lugs on the power distribution panel. For all installations use twin 7/.064 (S.L. No. PC 82) cables to supply 50V negative battery to the C Units. Cables from the C Units to other units are to be twin 7/.036 (S.L. No. PC 80).

3.6.3 The twin 7/.064 cable from the 50V negative battery (+ve lead connected direct from the battery, - ve lead via fuse on the end of the cabinet) is to be run around the wall to the control panel and terminated on the earth and fuse bars.

3.6.4 The 50V positive battery box is to be mounted on top of the 50V negative battery cabinet. The twin 3/.036 in. (S.L. No. PC 78) cable from the positive battery is to be run with the negative battery supply cables, terminated on the miscellaneous terminal strip in the first C Unit and multipled to other C Units.

3.6.5 The charge failure lead (1/.044) and earth common (7/.044) from the rectifiers and power panel respectively are also to be run with the negative battery supply cables to the first C Unit and multipled to other C & R Units. The earth common is to be connected to the earth bar fitted at the base of the first C Unit.

3.6.6 Where it is not possible to run the power cables to the C Unit under the floor - e.g., provision for a trough has not been made in a concrete floor it will be necessary to take the power cables, etc., to the top of the C Unit. Entry to the C Unit will then be made via the bushed holes at the top front of the unit.

3.6.7 The bushed holes at the top of the C Unit are to be sealed with compound S.L. No. P 338 as required.

3.7 LEAD-IN OF UNDERGROUND CABLES AND EARTH WIRE

3.7.1 Remove the wood blocks in the base of the C Unit to enable the external cables to enter the unit. When the cables are fixed in position the blocks are to be cut on the long edges to ensure that they fit as closely as possible around the cables, and, when the blocks are again in position, carefully seal all the spaces between the cables, blocks and iron with compound S.L. No. P 338.

3.7.2 The lead from the exchange earth follows the same route as the external cables and is to be soldered to the lug on the earth bar fitted at the base of the first C Unit and multipled to all other C Units.

3.8.1 For estimating purposes the A and C Unit cable quantities given in Table A may be used. For installations of over 200 lines the quantity of cable used may vary depending on the layout of the A Units. However, the quantity required will never be more than that shown in Table A. As the B, R, M, S and/or E Unit cabling will vary for each installation, the quantity required is to be calculated separately using the Project Specification and the typical equipment drawings. The largest suitable cable (max. 100W) is to be used to cable circuits from the B Units, etc- e.g., 20W per circuit use l00W cable; 12W per circuit use 61W cable.

3.8.2 Cut all cable to length on site, calculated lengths are not to be relied upon for cutting cables to size.

3.8.3 TABLE A NOTE: THE QUANTITIES SHOWN ARE IN FEET

Cable	S.L. No.	50 Line	100 Line	150 Line	200 Line	250 Line	300 Line
12 wire	PA 55A	9	21	33	45	69	81
20 wire	PA 59A	33	66	99	142	189	222
31 (33) wire	PA 71 (74A)	15	33	54	78	99	123
41 wire	PA 80A	-	-	-	-	-	-
51 wire	PA 93	15	33	54	78	99	123
61 wire	PA 99	96	183	306	405	543	642
80 wire	PA115	48	96	144	192	330	390
100 wire	PA 129A	-	-	-	-	-	-
1/0.036	PA 629B	9	18	30	45	60	78
22 SWG Scrn'd	PA 194A	9	18	30	45	60	81
3 pr Signal	PA 52	9	18	30	45	60	81
6 pr Signal	PA 55D	18	36	60	90	120	162

Cable	S.L. No.	350 Line	400 Line	450 Line	500 Line	550 Line	600 Line
12 wire	PA 55A	93	105	129	141	153	165
20 wire	PA 59A	225	288	369	402	435	468
31 (33) wire	PA 71 (74A)	150	180	207	237	270	306
41 wire	PA 80A	-	-	-	-	-	-
51 wire	PA 93	150	180	207	237	270	306
61 wire	PA 99	822	933	1092	1197	1383	1500
80 wire	PA115	450	510	756	828	900	972
100 wire	PA 129A	-	-	-	-	-	-
1/0.036	PA 629B	99	123	144	168	195	225
22 SWG Scrn'd	PA 194A	99	123	144	168	195	225
3 pr Signal	PA 52	99	123	144	168	195	225
6 pr Signal	PA 55D	198	246	288	336	390	450

SECTION 4 - EQUIPMENT

4.1 EQUIPMENT

4.1.1 The equipment is to be in accordance with the trunking and equipment diagram associated with the Project Specification.

4.1.2 Equipment Modifications. A number of circuits have been modified during and subsequent to the manufacture of the equipment, and it is essential that all equipment be checked before installation to see that it conforms to the latest GBW drawing issues.

4.1.3 Units. The allocation of switching equipment to each A Unit is shown on the Trunking and Equipment Diagram. The number of group selectors on each shelf are to be equal (or one extra on shelf E if there is an odd number).

4.1.4 B Units. The layout is shown on the equipment diagram associated with the Project Specification.

4.1.5 B Unit Fuse Panels. The normal fuse panel capacity of a B Unit is three. A fourth fuse panel if required can be fitted by re-siting the FA relay and miscellaneous terminal strips, Ref. Sketch E. The frame top angle and the top fuse panel supporting angle are to be suitably drilled and tapped to take the FA relay assembly. The miscellaneous terminal strips are to be mounted in the rear of the unit at the top on locally-made brackets.

4.1.6 M and R Units. These units are supplied fully equipped with final selector uniselectors, eight in the case of an M Unit and six in the case of an R Unit. The unused uniselector mechanisms are to be left in position.

4.1.7 Relay Adjustments. Relay adjustments are to be in accordance with the Engineering Instructions except in those cases (for red label relays) where relay adjustment data is supplied.

4..I.8 Balanced-Ringing Transformer. The balanced ringing transformer (required only if GBW 14450/1 installed) is to be mounted in the B Unit shown on the equipment diagram above the position to be occupied by the third fuse panel. Suitably drill and tap the top fuse panel supporting angle and the top angle of the unit frame. The transformer can then be mounted by screws through its base plate with the terminals outermost. Correct mounting will ensure that the regular installation of the third fuse panel is not interfered with.

4.1.9 Overflow Meters. Overflow meters to GBW 13730 Fig 22 to serve each working group selector level, or combined level, are to be installed in Unit A1. Note: Junction call count meters to GBW 13730 Fig 22K are not now installed.

4.1.10 Line Tester. If more than one C Unit installed the line tester used is to be the one in the "C2" Unit.

4.1.11 B/W Parent Junction Relay Sets.

(a) Particular attention is drawn to Notes 6, 7 and 11 on drawings GBW 14450 and 14451

Note 6 Unless otherwise specified, all junctions will use battery at the UAX and dialling earth at the parent exchange.

Note 7 In some cases the wires to ISC 39 (OR) and ISC 49 (SL) have been brought out (by the manufacturer) towards TJA on the top relay plate. These wires have been stripped and brought into contact, with the subsequent short-circuiting of R4. The wiring is to be arranged more suitably when the resistor is being fitted.

Note 11 It is pointed out, in connection with this note, that in those cases where the ring-through guard feature is provided at the parent exchange, earth is not to be connected to ISC 46.

(b) Tandem Exchanges

At tandem exchanges it is necessary to apply N.Z. Note A on circuits GBW 14450 and GBW 14451 for junctions other than those to the parent exchange.

4.1.12 Non-Magnetic Covers for Ringers.

(a) It is necessary to fit non-magnetic covers on the relay sets to drawings GBW 13690 Fig 1, GBW 13720 Fig 2, and GBW 13760. These covers are required to facilitate starting the vibrator by eliminating any flux by-path.

(b) Replacement covers should now have been supplied by the District Store from which the equipment was drawn. The existing covers may be scrapped.

(c) Relay sets, GBW 13761, and the vibrator relay of GBW 13721are already equipped with non-magnetic covers. In the most recent versions of these relay sets, GBW 13691, GBW 13762 and GBW 13722, the vibrator relay has been replaced by transistors and hence the problem of starting does not occur.

4.1.13 Lamp-Holders for Tones Circuit Ballast Lamps.

(a) Trouble has been encountered in a number of cases with the holders used for the ballast lamps LPI and LP2 of drawings GBW 13720 and GBW 13721 Fig. 3A, and GBW 13690 Fig. 4; See also Fig. 9 of drawings ATE 494065 or 494384 or GEC 700353, 700797 or 702509. The fixing rivets of these holders tend to work loose and short-circuit lamps, causing the tone valves to burn out.

(b) If this trouble occurs the holders are to be replaced with type BPO No. 12 (S.L. No. K 925). Because of existing drillings in the mounting plate, it will be necessary to lower the mounting positions slightly when the replacements are being fitted.

(c) Latest UAX supplies are equipped with BPO No. 12 type holders.

4.1.14 Revertive Relay Sets are to be connected to the last choice outlets on level 9 at all installations whether equipped with group selectors GBW 13890 or GBW 15960. An inherent circuit defect in group selectors, GBW 13890, can cause a CA alarm if the revertive relay sets are connected to early choice outlets. Although group selectors, GBW 15960, do not suffer from this defect the revertive relay sets are still to be connected to the last choice outlets at installations where only these group selectors are equipped.

4.2 TESTING

4.2.1 At the Completion of the Cabling. Testing is to be carried out as detailed in the Engineering Instructions TELES Auto H 3051 and H 3151 (refer also to diagram notes GBW 14000).

4.2.2 Call-through Test. In all cases a call-through test is required before the equipment is brought into service, and as with other types of step-by-step exchange installations a fault incidence exceeding 0.5% of the calls passes is regarded as unsatisfactory.

4.2.3 Junction Characteristics.

(a) As part of the installation testing the conductor resistance, insulation resistance, and transmission loss of the junctions are to be measured in order to verify that they are within the standard limits. These measurements are to be forwarded to the Engineer-in-Chief as early as possible prior to the bringing into service of the junctions.

(b) The transmission loss measurements of junctions are obtained by using the Siemens Halske sweep set (reference LINES Cable Jointing M1000)

4.2.4 To facilitate the transmission loss measurements of internal equipment, special oscillators, GBW 14320, transmission test sets GBW 14330, and dial units, GBW 14340, are available. These are designed for operation off the -50volt exchange battery, and have a terminal impedance of 600 ohms.

4.2.5 After the cutover a check is to be kept on overflow meter readings for indications of overloading. When the exchange traffic has had time to settle down to a normal level a full traffic check is to be undertaken.

4.2.6 Routine Alarm Tests.

(a) At the cutover of each new UAX it is essential that a strict routine should be organised whereby the operators or technical staff at the parent exchange at set times throughout the day call the test numbers of each dependent UAX (see E.I. TELES Auto H 5021 and H 5211).

(b) These routine tests are to be recorded in permanent form in the Parent Exchange Diary and a form Tel. Ex. 27A filled out where the indication of a fault is received. The action to be taken by the parent exchange operator in the event of a fault indication is to be clearly specified by the local organisation. Operators should watch for the erratic or unusual behaviour of UAX systems and bring this to the notice of the Maintenance Technician.

4.3 DRAWINGS

4.3.1 Circuit and Equipment Drawings. Drawings will be supplied in accordance with para. 11.11., 11.12. and 11.13. of ER/TP 1054.

4.3.2 Drawing Amendments. Any drawings requiring amendment, as a result of the work carried out, are to be marked-up and forwarded to the Engineer-in-Chief at the completion of the installation.

END OF INSTALLING SPECIFICATION I.S. 1170

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
1 - 4	IDF Multiple Side Verticals 1 and 2 SUBSCRIBERS MULTIPLE	-, +, P	Unit A1 - F/S Bank Terminal Blocks	-(B), +(W), P(R)	5 - 61W	F/S Multiple 800 - 899
6	IDF Local Side Verticals 4 and 5 LINE FINDER LEVELS	-, +, P1, P2, M	Unit A1 - L/F Bank Terminal Blocks	-(B), +(W), P1 Lev 9(W) P1 Lev 8(B), M(R) for O/L 1 -(O), +(W), P1 Lev 9(W) P1 Lev 8(O), M(R) for O/L 2	1 - 51W	L/F Levels 9 & 8
7 - 8	IDF Local Side Verticals 4 and 5 LINE FINDER LEVELS	-, +, P	Unit A1 - L/F Bank Terminal Blocks	-(B), +(W), P(R)	2 - 61W	L/F Levels 7, 6, 5, 4
9	IDF Local Side Verticals 4 and 5 LINE FINDER LEVELS	-, +, P	Unit A1 - L/F Bank Terminal Blocks	-(B), +(W), P(R)	1 - 31W	L/F Levels 3 & 2
10	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Levels 9 & 8
11	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Levels 7 & 6
12	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Levels 5 & 4 Provided if Required
13	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Levels 3 & 2 Provided if Required
14	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Level 1 Shelves E & F cabled separately
15	IDF Local Side Vertical 3	-,+, P, M	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1-80W	G/S Level 0 Shelves E & F cabled separately
16	IDF Multiple Side Vertical 4 CL RELAYS	-, +, ST, T TA, TB (No.1) -, +, ST, T TA, TB (No 2) HA1 HB1 HA2 HB2	Unit A1 - Control Relay Sets 1 & 2 L/F Bank Terminal	U22(B), U24(W), U29(O) U7(W), U5(G), U30(W) - No 1 U22(BN), U24(W), U29(S) U7(W), U5(B-W), U30(W) - No 2 HA1 - VMB Lev 9(W) HB1 - VMB Lev 8(B-O) HA2 - Term HA (W) HB2 - Term HB (B-G)	1 - 20W	Control Relay Sets 1 & 2 and allotter start.
17	Unit C ALARMS & TONES	LP, REL (FA) LP, REL (RLSE) PG1-5 TPR, ST H, +B1-4 BT, E	Unit A1 - Alarms and Tones	LP(B), REL(W) - FA LP(O), REL(W) - RLSE PG1-5(G) Spare(W) TPR(BN), ST(W) H(S), +B1-4(W) BT(B-W), E(W)	1 - 6 Pr Signal	FA, RLSE, PG ALM, TP, +B Busy Tone
18	Unit C ALARMS & TONES	U52, U54, U56 U58, U60, U68	Unit A1 - Meter Routine Test	U52(B), U54(W), U56(O) U58(W), U60(G), U68(W)	1 - 3 Pr Signal	Meter Routine Test

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
19	Unit C ALARMS & TONES	NU, E DT, E IRR, IR (Odd) IRR, IR (Even) RST, CA RT, E	Unit A1 - Ringing and Tones	NU(B), E(W) DT(O), E(W) IRR(W), RR(G) Odd IRR(W), RR(BN) Even RST(S), CA(W) RT(B-W), E(W)	1 - 6 Pr Signal	NU Tone, Dial Tone Ringing Supply, Ring Start, Control Alarm, Ring Tone
20	Unit C - ALARMS & TONES	SC, ZC	Unit A1 - S & Z Pulses	SC(B), ZC(W)	1 - 1 Pr Signal	S and Z Pulses
21	Unit C - ALARMS & TONES	OFBT	Unit A1 - OFBT	OFBT(W)	1 - 1/22 SWG Screened	O/F Busy Tone
22 - 25 26	As for runs 6 - 9 As for run 16		Unit A2 - L/F Bank Terminal Blocks			L/F Multiple
27 - 31	As for runs 17 - 21		Unit A2 - Tones & Alarms			Tones & Alarms
32 - 36	As for runs 1 - 5		Unit A3 - F/S Bank Terminal Blocks			F/S Multiple 700 - 799
37 - 40 41	As for runs 6 - 9 As for run 16		Unit A3 - L/F Bank Terminal Blocks			L/F Multiple
42 - 46	As for runs 17 - 21		Unit A3 - Tones & Alarms			Tones & Alarms
47 - 50 51	As for runs 6 - 9 As for run 16		Unit A4 - L/F Bank Terminal Blocks			L/F Multiple
52 - 56	As for runs 17 - 21		Unit A4 - Tones & Alarms			Tones & Alarms
57 - 61	Unit A1 F/S Bank Terminal Blocks	-, +, P	Unit A2 - F/S Bank Terminal Blocks	-(B), +(W), P(R)	5 - 61W	F/S Multiple 800 - 899
62 - 66	Unit A3 F/S Bank Terminal Blocks	-, +, P	Unit A4 - F/S Bank Terminal Blocks	-(B), +(W), P(R)	5 - 61W	F/S Multiple 700 - 799
67	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Levels 9 & 8
68	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Levels 7 & 6
69	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Levels 5 & 4 (Provide when required)
70	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Levels 3 & 2 (Provide when required)
71	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Level 1 (Shelves E & F cabled separately)
72	Unit A1 G/S Bank Terminal Blocks	-, +, P, M	Unit A2 - G/S Bank Terminal Blocks and loops to Unit A3 and Unit A4	-(B), +(W), P(W), M(O)	1 - 80W	G/S Multiple Levels 0 (Shelves E & F cabled separately)

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
73	IDF Local Side Vertical 3 UNIT A1 - A4 O/F METERS	LEV 0 - 9	Unit A1 - G/S Bank Terminal Blocks and loop to Unit A2, Unit A3 and Unit A4	O/F1(W), O/F2(B) O/F3(W), O/F4(O)	1 - 12W	G/S Overflow Meters as required
74	Unit A1 - F/S U-Points	U1, U2, U9, U7	Unit A1 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1 - 20W	F/S 1 - 5 to G/S Lev 8 O/L's 1 - 5
75	Unit A2 - F/S U-Points	U1, U2, U9, U7	Unit A2 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1 - 20W	F/S 6 - 10 to G/S Lev 8 O/L's 6 - 10
76	Unit A3 - F/S U-Points	U1, U2, U9, U7	Unit A3 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1 - 20W	F/S 1 - 5 to G/S Lev 7 O/L's 1 - 5
77	Unit A4 - F/S U-Points	U1, U2, U9, U7	Unit A4 - G/S Bank Terminal Blocks	-(B), +(W), P(W), M(O)	1 - 20W	F/S 6 - 10 to G/S Lev 7 O/L's 6 - 10

The Cabling for the 2nd and third suites of "A" units is the same as for runs 1 - 77 inclusive. Overflow Meters and Group selector levels are to be commoned between "C" units as required.

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
A	Unit C - ALARMS & TONES.	CR, CRR RST, P/ST 6 Sec	Units B - Ringing etc.	CR(B), CRR(W) RST(O), Spare(W) P/ST(G), 6 Sec(W)	1 - 3 Pr Signal	Ringing and 6 Sec Pulse to B Units
B	Unit C - ALARMS & TONES	LP, REL TPR, ST H, TPR/R BT, E NU, E RT, E	Units B - Alarms and tones etc.	LP(B), REL(W) TPR(O), ST(W) H(G), TPR/R(W) BT(BN), E(W) NU(S), E(W) RT(B-W), E(W)	1 - 6 Pr Signal	FA, Tones and Pulses to B Units
C	Unit C - METER PULSES	1, 2, 3, 4 5, 6, S,Z	Units B - Meter Pulses	1(B), 2(W), 3(O), 4(W) 5(G), 6(W), S(BN), Z(W)	1 - 6 Pr Signal	Meter Pulses to B Units
D	Unit C - ALARMS & TONES	OFBT	Units B - OFBT	OFBT(W)	1 - 1/22 SWG Screened	O/F Busy tone to B Units
E	Unit C - +VE BATT AND PULSES	+BATT, R/P	Units B - +VE Batt & Rev Pulse	+VE(B), REV/P(W)	1 - 1 Pr Signal	+VE Battery & Rev Pulse to B Units
G	IDF Local Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13970	- tag 23(B) or (B) + tag 13(W) or (W) P tag 3(R) or (O) Spare (W)	1 - 31W per 10 circuits 1 - 51W per 15 circuits	R/S to O/G Junctions
H	IDF Multiple Side Vertical 3 O/G CCTS FROM SELR LEVS	-, +, P, M	Unit B - O/G Junction R/S to GBW 13970	- tag 21 (B) + tag 11 (W) P tag 1 (W) M tag 31 (O)	1 - 41W per 10 circuits	G/S Levels to O/G Junction R/S

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
I	IDF Multiple Side Vertical 5 O/G SM SETS TO I/C SM SETS	-, +, P1	Unit B - O/G Junction R/S to GBW 13970	-1 tag 22 (B) +1 tag 12 (W) P1 tag 2 (R)	1 - 31W per 10 circuits	I/C Junction R/S to O/G Junction R/S
J	Unit B - O/G Junc R/S to GBW 13970	4(H), 24(C) 5(PU), 25(TP) 6(MB), 27(SFC) 7(SFM), 32(P) 8(TS), 35(DS) 14(CB), 41(M) 15(TN), 42(PA) 17(SFO),43(EF) 46(HL)	Unit B - Route Discriminating R/S to GBW 13920	H tag 26(B), PU tag 29(W) MB tag 28(O), SFM tag 17(W) TS tag 21(G), CB tag 25(W) TN tag 24(BN), SFO tag 18(W) C tag 16(S), TP tag 27(W) SFC tag 19(B-W), P tag 13(W) DS tag 14 (B-O), M tag 11(W) PA tag 12(B-G), EF tag 22(W) HL tag 20(B-BN), Spare(W)	1 - 100W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set
K	Unit B - O/G Junc R/S to GBW 13970	4(H), 32(P) 5(PU), 35(DS) 8(TS), 41(M) 15(TN), 42(PA) 24(C), 43(EF) 25(TP), 46(HL)	Unit B - Route Discriminating R/S to GBW 13940	H tag 4(W), P tag 32(W) PU tag 5(B), DS tag 44(G) TS tag 40(R), M tag 11(R) TN tag 25(W), PA tag 42(W) C tag 24(O), EF tag 12 (BN) TP tag 2(R), HL tag 23(R)	1 - 61W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set
L	IDF Local Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - I/C Junction R/S to GBW 16880	- tag(B) + tag(W) P tag(R)	1 - 31W per 10 circuits	I/C R/S to I/C Junction
M	IDF Local Side Vertical 2 JUNCS TO L/F AND CL RELS	HA1, HB1 HA2, HB2 T1, T2 TB1, TB2 TA1, TA2 +1, +2 -1, -2 ST1, ST2	Unit B - I/C Junction R/S to GBW 16880	HA1 tag 35(W) HA2 tag 41(B) T1 tag 1(W) TB1 tag 25(O) TA1 tag 5(W) of (BN) +1 tag 11(W) -1 tag 21(G) ST1 tag 31(BN) HB1 tag 45(W) HB2 tag 42(S) T2 tag 2(W) TB2 tag 26(B-W) TA2 tag 6(W) of (B-G) +2 tag 12(W) -2 tag 22(B-O) ST2 tag 32 (B-G)	1 - 80W per 5 circuits	I/C R/S to Control Relay Sets

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
N	IDF Multiple Side Vertical 2 I/C SM SETS TO LINE FNDR LEVS	-, +, M, P1, P2	Unit B - I/C Junction R/S to GBW 16880	- tag 33(B) + tag 23(W) M tag 43(R) P1 tag 3 (O) P2 tag 13(W) Spare (R)	1 - 31W per 5 circuits	I/C R/S to Line Finder Banks
O	IDF Local Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13950	- tag 8(B) + tag 18(W) P tag 28(R)	1 - 31W per 10 circuits	R/S to O/G Junctions
P	IDF Multiple Side Vertical 3 O/G CCTS FROM SELR LEVELS	-, +, P, M	Unit B - O/G Junction R/S to GBW 13950	- tag 10(B) + tag 20(W) P tag 30(W) M tag 40(O)	1 - 20W per 5 circuits or 1 - 41W per 10 circuits	G/S Levels to O/G Junction R/S
Q	IDF Multiple Side Vertical 5 O/G SM SETS TO I/C SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13950	-1 tag 9(B) +1 tag 19(W) P1 tag 29(R)	1 - 31W per 10 circuits	I/C Junction R/S to O/G Junction R/S
R	IDF Multiple Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13960	- tag 23 (B) + tag 13(W) P tag 3(R)	1 - 31W per 10 circuits	R/S to O/G Junctions
S	IDF Multiple Side Vertical 3 O/G CCTS FROM SELR LEVELS	-, +, P, M	Unit B - O/G Junction R/S to GBW 13960	- tag 21(B) + tag 11(W) P tag 1(O) M tag 31(W)	1 - 20W per 5 circuits or 1 - 41W per 10 circuits	G/S Levels to O/G Junction R/S
T	IDF Multiple Side Vertical 5 O/G SM SETS TO I/C SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13960	-1 tag 22(B) +1 tag 12(W) P1 tag 2 (R)	1 - 31W per 10 circuits	I/C Junction R/S to O/G Junction R/S
U	Unit B - O/G Junc R/S to GBW 13960	4(H), 25(TP) 5(PU), 27(SFC) 6(MB), 32(P) 7(SFM), 35(DS) 8(TS), 41(M) 14(CB), 42(PA) 15(TN), 43(EF) 17(SFO),45(TO) 24(C), 46(HL	Unit B - Route Discriminating R/S to GBW 13920	H tag 26(B), PU tag 29(W) MB tag 28(O), SFM tag 17(W) TS tag 21(G), CB tag 25(W) TN tag 24(BN), SFO tag 18(W) C tag 16(S), TP tag 27(W) SFC tag 19(B-W), P tag 13(W) DS tag 14 (B-O), M tag 11(W) PA tag 12(B-G), EF tag 22(W) HL tag 20(B-BN), Spare(TO)	1 - 100W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
V	Unit B - O/G Junc R/S to GBW 13960	4(H), 32(P) 5(PU), 35(DS) 8(TS), 41(M) 15(TN), 42(PA) 24(C), 43(EF) 25(TP), 46(HL)	Unit B - Route Discriminating R/S to GBW 13940	H tag 4(W), P tag 32(W) PU tag 5(B), DS tag 44(G) TS tag 40(R), M tag 11(R) TN tag 25(W), PA tag 42(W) C tag 24(O), EF tag 12 (BN) TP tag 2(R), HL tag 23(R)	1 - 61W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set
X	IDF Local Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - I/C Junction R/S to GBW 13990	- tag 21(B) or (B) + tag 11(W) or (W) P tag 1(O) or (R) Spare(W)	1 - 20W per 5 circuits or 1 - 31W per 10 circuits	I/C R/S to I/C Junction
Y	IDF Local Side Vertical 2 JUNCS TO L/F AND CL RELS	HA1, HB1 HA2, HB2 T1, T2 TB1, TB2 TA1, TA2 +1, +2 -1, -2 ST1, ST2	Unit B - I/C Junction R/S to GBW 13990	HA1 tag 35(W) HA2 tag 41(B) T1 tag 1(W) TB1 tag 25(O) TA1 tag 5(W) of (BN) +1 tag 11(W) -1 tag 21(G) ST1 tag 31(BN) HB1 tag 45(W) HB2 tag 42(S) T2 tag 2(W) TB2 tag 26(B-W) TA2 tag 6(W) of (B-G) +2 tag 12(W) -2 tag 22(B-O) ST2 tag 32 (B-G)	1 - 80W per 5 circuits	I/C R/S to Control Relay Sets
Z	IDF Multiple Side Vertical 2 I/C SM SETS TO LINE FNDR LEVS	-, +, M, P1, P2	Unit B - I/C Junction R/S to GBW 16880	- tag 33(B) + tag 23(W) M tag 43(R) P1 tag 3 (O) P2 tag 13(W) Spare (R)	1 - 31W per 5 circuits	I/C R/S to Line Finder Banks
AA	IDF Multiple Side Vertical 4 DEP JCN O/F METER	B 1/6	Unit B - I/C Junction to R/S GBW 13990	OM tag 41(R-W)	See Run Z	R/S to O/F Meter
AB	IDF Multiple Side Vertical 5 JUNCTION HUNTER BANKS	-, +, P	Unit B - I/C Junction R/S to GBW 13990	-1(B) -2(O) +1(W) +2(W) P1(R) P2(R)	1 - 75W per J/H Multiple	J/H Banks to O/G Junction R/S

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
AC	I/C Junction R/S GBW 13990 to JCN HUNTER	SCA 22 SCA12 SCA 2 SCA 32 SCA 44 SCA 4 SCA 14 SCA 24	Junction Hunters	W- (B) W+ (W) WP (O) 2/25 (W) dm2 (G) 1/1 (W) 1/25 (BN) 1/24 (W)	1 - 41W per 5 circuits or 1 - 80W per 10 circuits	I/C R/S to Junction Hunters
AD	IDF Local Side Vertical 1 SM SETS FROM JCN HUNTER	-, +, P	Unit B - O/G Junction R/S to GBW 13930	-1 tag 24(B) +1 tag 14(W) P1 tag 4(R)	1 - 31W per 5 circuits or 1 - 61W per 10 circuits	J/H Banks to O/G Junction R/S
AE	IDF Local Side Vertical 1 SM SETS FROM JUNCS OR O/G SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13930	- tag 23 (B) + tag 13 (W) P tag 3 (R)	1 - 31W per 5 circuits or 1 - 61W per 10 circuits	R/S to O/G Junctions
AF	IDF Multiple Side Vertical 3 O/G CCTS FROM SELECTOR LEVS	-, +, P,M, M1	Unit B - O/G Junction R/S to GBW 13930	- tag 21(B) + tag 11(W) P tag 1 (R) M tag 41(W) M1 tag 31(O) Spare (R)	1 - 31W per 5 circuits	G/S Levels to O/G R/S
AG	IDF Multiple Side Vertical 5 O/G SM SETS TO I/C SM SETS	-, +, P	Unit B - O/G Junction R/S to GBW 13930	-1 tag 22(B) +1 tag 12(W) P1 tag 2 (R)	1 - 31W per 10 circuits	O/G R/S to I/C Junction R/S
AH	Unit B - O/G Junction R/S to GBW 13930	5(PU), 20(TS) 6(MB), 25(DS) 7(SFM)27(SFC) 8(H), 28(C) 10(TP), 32(P) 15(TN), 40(HL) 16(M), 42(PA) 17(SFO),50(EF) 18(CB)	Unit B - Route Discriminating R/S to GBW 13920	H tag 26(B), PU tag 29(W) MB tag 28(O), SFM tag 17(W) TS tag 21(G), CB tag 25(W) TN tag 24(BN), SFO tag 18(W) C tag 16(S), TP tag 27(W) SFC tag 19(B-W), P tag 13(W) DS tag 14 (B-O), M tag 11(W) PA tag 12(B-G), EF tag 22(W) HL tag 20(B-BN), Spare(TO)	1 - 100W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set
AI	Unit B - O/G Junction R/S to GBW 13930	5(PU), 25(DS) 8(H), 28(C) 10(TP), 32(P) 15(TN), 40(HL) 16(M), 42(PA) 20(TS), 50(EF)	Unit B - Route Discriminating R/S to GBW 13940	H tag 4(W), P tag 32(W) PU tag 5(B), DS tag 44(G) TS tag 40(R), M tag 11(R) TN tag 25(W), PA tag 42(W) C tag 24(O), EF tag 12 (BN) TP tag 2(R), HL tag 23(R)	1 - 61W per 5 circuits	O/G Junction to Route Discriminating & Timing Relay Set

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
AJ	IDF Local Side Vertical 1 SM SETS FROM JCN HUNTERS	-, +, P	Unit B - B/W Junction R/S to GBW 14450 or GBW 14451	- tag 1SC 11(B) + tag 1SC 21(W) P tag 1SC 1 (R)	1 - 31W per 5 circuits or	J/H Banks to Junction R/S
AK	IDF Local Side Vertical 1 SM SETS FROM JCNS OR O/G SM SETS	-, +, P	Unit B - B/W Junction R/S to GBW 14450 or GBW 14451	-1 tag 1SC 2 (O) +1 tag 1SC 12(W) P1 tag 1SC 22(R)	1 - 61W per 10 circuits	Junction R/S to B/W Junction
AL	IDF Multiple Side Vertical 3 O/G CCTS FROM SELR LEVELS	-, +, P, M	Unit B - B/W Junction R/S to GBW 14450 or GBW 14451	- tag 1SC 11(B) + tag 1SC 21(W) P tag 1SC 41(W) M tag 1SC 31(O)	1 - 20W per 5 circuits or 1 - 41W per 10 circuits	G/S Levels to Junction R/S
AM	IDF Local Side Vertical 2 JUNCS TO L/F AND CL RELS	HA1, HB1 HA2, HB2 T1, T2 TB1, TB2 TA1, TA2 +1, +2 -1, -2 ST1, ST2	Unit B - B/W Junction R/S to GBW 14450 or GBW 14451	HA1 tag 1SC 4(W) HA2 tag 1SC 3(B) T1 tag 1SC 24(W) TB1 tag 1SC 44(O) TA1 tag 1SC 34(W) of (BN) +1 tag 1SC 15(W) -1 tag 1SC 5(G) ST1 tag 1SC 25(BN) HB1 tag 1SC 14(W) HB2 tag 1SC 37(S) T2 tag 1SC 6(W) TB2 tag 1SC 36(B-W) TA2 tag 1SC 16(W) of (B-G) +2 tag 1SC 17(W) -2 tag 1SC 7(B-O) ST2 tag 1SC 27(B-G)	1 - 80W per 5 circuits	I/C R/S to Control Relay Sets
AN	IDF Multiple Side Vertical 2 I/C SM SETS TO LINE FNDR LEVS	-, +, M, P1, P2	Unit B - B/W Junction R/S to GBW 14450 or GBW 14451	- tag 1SC 3(B) + tag 1SC 13(W) M tag 1SC 23(R) P1 tag 1SC 33(O) P2 tag 1SC 43(W) Spare (R)	1 - 31W per 5 circuits	I/C R/S to Line Finder Banks

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
AO	IDF Local Side Vertical 2 JUNCS TO L/F AND CL RELS	HA1, HB1 HA2, HB2 T1, T2 TB1, TB2 TA1, TA2 +1, +2 -1, -2 ST1, ST2	Unit B - I/C Junction R/S to GBW 13780	HA1 tag 35(W) HA2 tag 41(B) T1 tag 1(W) TB1 tag 25(O) TA1 tag 5(W) of (BN) +1 tag 11(W) -1 tag 21(G) ST1 tag 31(BN) HB1 tag 45(W) HB2 tag 42(S) T2 tag 2(W) TB2 tag 26(B-W) TA2 tag 6(W) of (B-G) +2 tag 12(W) -2 tag 22(B-O) ST2 tag 32 (B-G)	1 - 100W per 5 circuits	I/C R/S to Control Relay Sets
AP	IDF Multiple Side Vertical 2 I/C SM SETS TO LINE FNDR LEVS	-, +, M, P1, P2	Unit B - I/C Junction R/S to GBW 13780	- tag 33(B) + tag 23(W) M tag 43(R) P1 tag 3 (O) P2 tag 13(W) Spare (R)	1 - 31W per 5 circuits	I/C R/S to Line Finder Banks
AQ	IDF Local Side Vertical 1 SM SETS FROM JUNCS	-, +, P	Unit B - I/C Junction R/S to GBW 13780	- tag 24(B) + tag 14(W) P tag 4(W) cct2 (G)	1 - 20W per 6 circuits	I/S R/S to Discriminating Selector Banks
AR	Unit A - G/S Bank Terminal Blocks	-, +, P, M	Unit R (attached)	- U1(B) + U2(W) P U9(R) M U8(W) cct2 (BN) cct3 (R)	1 - 31W per 6 circuits	G/S Level to R-Unit R/S
AS	Unit A - G/S Bank Terminal Blocks	-, +, P, M	Unit M - Final Selector to GBW 14400	- U1(B) + U2(W) P U9(W) M U8(O)	1 - 20W per 5 circuits	G/S Level to M-Unit R/S
AT	IDF Multiple Side Vertical 4 M UNIT F/S MULT	-, +, P	Unit M - Final Selector to GBW 14400	-(B), +(W), P(R)	1 - 61W per F/S Multiple	M-Unit F/S Multiple

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
AU	Unit M - Final Selector to GBW 14400	U63(A) U65(D) U67(M) U69(R) U61(S) U59(C/ST) U57(C/H) U71(M/ST) U32(CR) U19(RR)	Unit B - Ringing Code R/S to GBW 13760	A tag SCB 1(B) D tag SCB 2(W) M tag SCB 3(O) R tag SCB 4(W) S tag SCB 5(G) C/ST tag SCB 7(W) C/H tag SCB 6(BN) M/ST tag SCB 8(W) CR tag SCB 9(S) RR tag SCB 1o(W)	1 - 12W	M-Unit F/S to Code Ringing Terminals
AV	IDF Multiple Vertical 4 REV CALL SM SETS	-, +, P	Unit B - Revertive Call R/S to GBW 13770	- tag 21(B) + tag 11(W) P tag 1(O) M tag (W)	1 - 20W per 5 circuits	G/S Level to Rev Call R/S
AW	Unit B - Revertive Call R/S to GBW 13770	CR tag 26 RR tag 16 C/H tag 25 C/ST tag 5 M/ST tag 40 S tag 44 R tag 34 M tag 24 D tag 14 A tag 4	Unit B - Ringing Code R/S to GBW 13760	CR tag SCB 9(B) RR tag SCB 10(W) C/H tag SCB 6(O) C/ST tag SCB 7(W) M/ST tag SCB 8(G) S tag SCB 5(W) R tag SCB 4(BN) M tag SCB 3(W) D tag SCB 2(S) A tag SCB 1(W)	1 - 12W	Rev Call R/S to Code Ringing Terminals
AX	IDF Local Side Vertical 1 5-PARTY M OR R SM SETS	-IN +In	Unit B - M or R Line R/S to GBW 13750 or GBW 14410	-IN tag 21(B) +IN tag 11(W)	1 - 100W per 10 circuits	Line to Relay Set
AZ	IDF Local Side Vertical 1 5-PARTY M OR R SM SETS	- OUT + OUT P OUT	Unit B - M or R Line R/S to GBW 13750 or GBW 14410	- OUT tag 23 (O) + OUT tag 13 (W) P OUT tag 3 (G)		R/S to Sub's Line Circuit
BA	IDF Local Side Vertical 1 5-PARTY M OR R SM SETS	PA - PE	Unit B - M or R Line R/S to GBW 13750 or GBW 14410	PA tag 2 (W) PB tag 12 (BN) PC tag 22 (W) PD tag 32 (S) PE tag 42 (W)		F/S P Wires to R/S

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
BB	Unit B - M or R Line R/S to GBW 13750 or GBW 14410	CR tag 26 RR tag 16 C/H tag 25 C/ST tag 5 M/ST tag 40 S tag 44 R tag 34 M tag 24 D tag 14 A tag 4	Unit B - Ringing Code R/S to GBW 13760	CR tag SCB 9(B) RR tag SCB 10(W) C/H tag SCB 6(O) C/ST tag SCB 7(W) M/ST tag SCB 8(G) S tag SCB 5(W) R tag SCB 4(BN) M tag SCB 3(W) D tag SCB 2(S) A tag SCB 1(W)	1 - 12W	R/S to Code Ringing Terminals
BC	IDF Multiple Vertical 5 DISC GRP SELR BANKS (13R)	-, +, P	Unit R - Discriminating Selector to GBW 13650	-1 (B) +1 (W) P1 (W) P2 (G) -2 (O) +2 (W)	1 - 20W per DS Multiple	D/S Multiple 1 - 6 to IDF (When R-Unit is attached)

There are several relay sets (e.g. AC3, new junction relay sets etc) not covered by this cabling schedule. However the cabling of these circuits is adequately covered by GBW 15870. The colour of the leads is to follow a similar pattern to that shown in this schedule (e.g. +(W), -(B), P(R)) and the cable used is to be as large as practicable but should not exceed 100W.

CABLING AT REMOTE M UNITS (B-UNIT TO RM-UNIT)

Run No	From	Tags	To	Tags & Colours	No. and Size of Cables	Circuits Cabled
BD	Term Strip "J" D/S Multiple 15 - 18	-, +, P	Unit B - Revertive Call R/S to GBW 13770	-1(B) -2(O) +1(W) +2(W) P1(W) P2(G)	1 - 12W per 4 circuits	D/S Multiple 15 - 18 to Revertive Call Relay Sets
BE	Term Strip "L" & "M"	CR tag 82 RR tag 62 H tag 96 RST tag 94 MST tag 68 S tag 147 R tag 146 M tag 145 D tag 142 A tag 141	Unit B - Revertive Call R/S to GBW 13770	CR tag 26(B) RR tag 16(W) H tag 25(O) RST tag 5(W) MST tag 40(G) S tag 40(W) R tag 34(BN) M tag 24(W) D tag 14 (S) A tag 4 (W)	1 - 6 pr Signal	Ringing & Codes to Revertive Call R/S
BF	Term Strip "K" & "L"	LP tag 21 REL tag 42 ST tag 104 H tag 105 TPRR tag 65 NU tag 32 E tag 12	Unit B - Misc T/S	LP (B) REL (W) ST (O) H (W) TPRR (G) Spare (W) NU (BN) E (W)	1 - 6 pr Signal	FA, TP and NU Tone