CARRIER SYSTEM WB 400

Subscriber's Installation

1 **GENERAL** This instruction lists the items required and describes the work involved for the connexion of a Receiver, Carrier, WB No. 400A to the telephone line at a subscriber's premises.

Authority for installation will be given by the GM (Sales Divn) by the issue of an Advice Note.

The items are described in E9 E2080.

2 **STORES REQUIRED** The engineering items of equipment and stores required for an installation are given in Table 1. The instruction book and labels are dealt with in par 11.

TABLE 1

Rate Book item	Code No.	Stores control	Quantity required	Remarks	Relevant par
Receiver, Carrier, WB No. 400A	40 0099	E	1	-	3
Battery, Dry, No. 27	17 0020	E	2	To be retained by subscriber	6
Filter-unit WB No. 400B	38 3304	E	1	-	4
Filter-unit WB No. 401B	37 2454	E	As reqd	For PBX extensions	4
Filter-unit WB No. 405A	37 2503	E	"	For shared service lines	5
Bracket, Mountings, WB No. 4000A	44 0226	E	"	-	3
Block, Terminal, No. 20/2	43 0250	See Note	"	-	-
Balancing-unit WB No. 400A	37 0020	E	"	-	7
Cable PVC No. 1, 2W 6½	See remarks	-	"	030154 cream or 032790 grey	-
Cable, PVC No. 1 3W 6½	"	-	"	030155 cream or 032791 grey	-

NOTE:- Requisitions for this item should be marked 'PL 3322' in red ink.

INSTALLATION

3 **POSITIONING OF ITEMS** The position of the receiver should be agreed with the subscriber. It may be screwed to a wooden surface, such as an existing shelf using the extension lugs on the baseplate or it may be fitted on a wall by using a Bracket, Mounting, WB No. 400A. The receiver must not be fitted above a radiator or other heating appliance which would reduce the life of the dry battery.

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The filter-unit should normally be fitted near the protector or terminal block at the lead-in point but it may be fitted at any suitable point in wiring to the telephone block terminal.

The balancing-unit, if fitted, should be close to the receiver in order that it may be adjusted while listening to the receiver.

4 WIRING The wiring within the subscriber's premises should be in accordance with Fig 1 for a normal installation, or with Fig 3 for an installation including a balancing-unit. The terminals marked E on the filter-unit are for the through earth connexion where a shared service line or a balancing-unit is involved (see Fig 3). At other installations they are not used.

At a PBX installation where the receiver is not installed near the exchange line termination, a long cable run may be avoided by feeding the carrier frequency over the line serving an extension. The wiring for this arrangement is shown in Fig 2. One Filter-unit WB No. 400B and one-Filter-unit WB No. 401B should be fitted inside the PBX equipment cabinet. At the extension telephone a further Filter-unit WB No. 400B is required.

At an ROC post the wiring should be in accordance with Dgm AD/ADW 3344.

5 SHARED SERVICE When a shared service line is used to feed a receiver, a Filter-unit WB No. 405A is fitted at both telephone subscribers' installations. The filter-units should be inserted between the protectors or terminal blocks at the lead-in point and the terminal blocks of the telephones. The RECR terminals of the filter-unit at the non-WB 400 telephone subscriber's installation should be left disconnected.

6 SETTING-UP On completion of the installation the receiver should be set-up as follows:-

(a) Connect the battery to the appropriate leads in the lower compartment and replace the baseplate. The second battery should be handed to the subscriber for storage in a dry cool place.

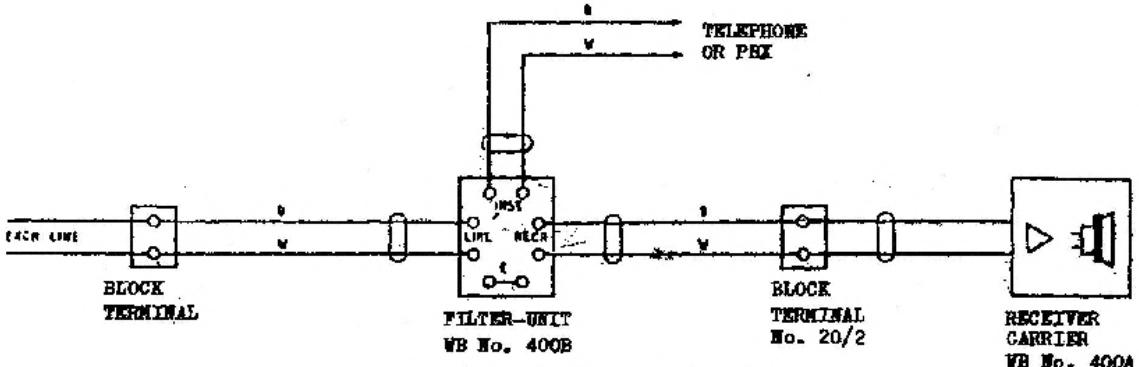
(b) Switch on the receiver. Insert a screwdriver through the hole in the baseplate and adjust the potentiometer until the monitor tick signal is just audible when the volume control is in its minimum position. The tick should resemble that of a clock and should not be loud enough to cause annoyance. The receiver is now adjusted for receiving the monitor tick signal, tones and speech.

It should be explained to the subscriber that as the battery deteriorates the volume control will need to be progressively advanced in order to maintain the monitor tick signal at its original level.

(c) Demonstrate to the subscriber that the receiver is correctly adjusted for speech although the monitor tick signal is just audible by asking the Carrier Control Point to make a test announcement.

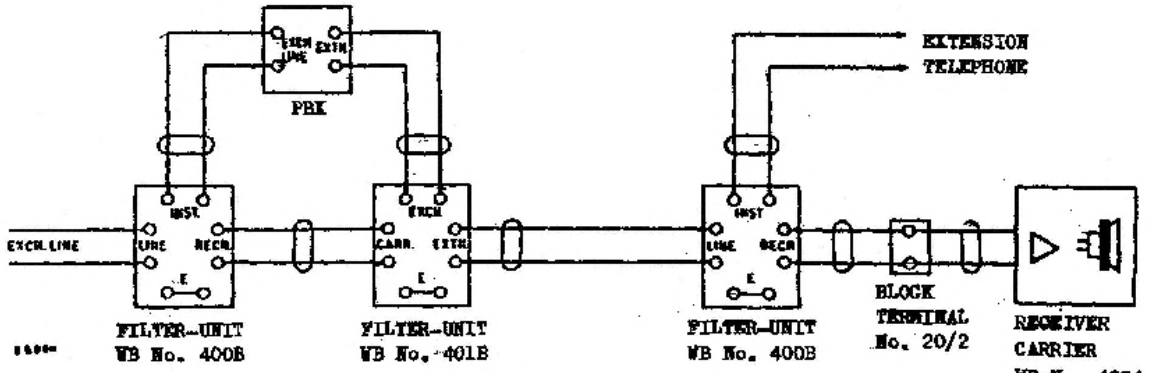
(d) Ensure that the subscriber is satisfied with the installation, switch off the receiver and explain that he will receive instructions from the Chief Constable regarding times for switching on.

Figs follow



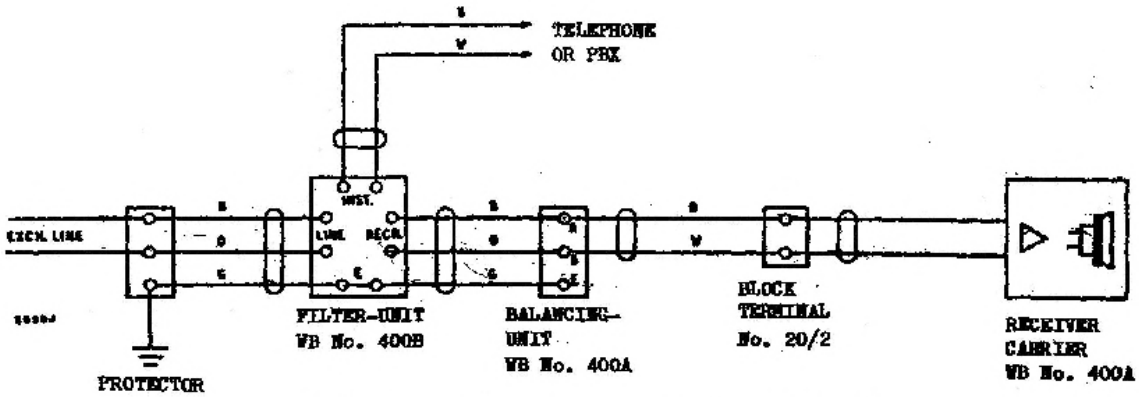
WIRING IN CABLE, PVC No. 1, 2-WIRE/6½

FIG 1 NORMAL INSTALLATION



WIRING IN CABLE, PVC No. 1, 2-WIRE/6½

FIG 2 INSTALLATION USING A PBX EXTENSION



WIRING IN CABLE, PVC, No. 1, 2-WIRE/6½ AND 3-WIRE/6½

FIG 3 INSTALLATION WITH BALANCING UNIT

7 **NOISE** The elimination of radio and other forms of noise interference on the complete system is dealt with in relevant TIs. The elimination of noise from a subscriber's line is described in this paragraph.

A subscriber's line which has open wires in its composition will be exposed to radio interference from overseas radio telegraph stations, Rugby Radio Station (68 kHz) or from a nearby DECCA Navigator transmitter. Normally, the noise-suppression device in the receiver will make the interference tolerable but on some routes the interference caused by Rugby Radio Station will be excessive and a Balancing-unit WB No. 400A will be required. Table 2 gives an indication of the conditions under which the units should be fitted, but the decision whether or not to install a balancing-unit will depend on the degree of interference.

TABLE 2

Distance from Rugby (miles)	Class of open wire route
0-10	All
10-30	Over two spans
30-60	Over six spans
60-100	Exposed and long routes
Over 100	None

The fitting of the balancing-unit has been described in pars 3 and 4. It is adjusted by changing the straps across the fixed capacitors and at the same time adjusting the potentiometer until the interfering signal is reduced. Final balance is obtained by alternatively adjusting the pre-set capacitors and the potentiometer. During the adjustment the volume control may be progressively advanced to enable the best adjustment to be made.

8 The distribution units in the exchange can be arranged to feed the carrier frequency to line at either a high level or low level. By using a high-level in place of a low-level feed the signal to noise ratio is improved by 14 dB. For this reason it is recommended in A8 C2053 that high-level feeds are used on all subscribers' lines having six or more spans of open wire. In some instances it is desirable to use a high-level feed for lines having less than six spans. The methods of strapping the units at the exchange for different levels are described in E9 E2080.

9 The replacement of open wires by overhead cable would give almost complete immunity from radio interference but such provision would not be justified for a single installation. Cable, Dropwire, No. 2 or No. 3 will give a worthwhile improvement on certain routes. Transposing open wires is not a worthwhile expedient.

10 **GENERATING AND RADIO STATIONS** At some power generating stations and radio transmitter stations there can be a dangerously high difference in earth potential between that at the station and that at the local telephone exchange which may be some miles away (see POEEJ Vol 63, part 1, April 1970). To prevent damage to life, isolating units are fitted in all lines to the exchange, the units being fitted in the generating station or radio transmitter. These units are so constructed that there is very high insulation at d.c. between the station and the lines but they allow the passage of audio frequencies with little loss by means of a transformer. Signalling is made possible by using relays with high

insulation between coils and contacts. The units have a high attenuation at 72 kHz and if a carrier receiver has to be fitted at the station it is necessary to fit a Line Isolating-Unit WB No. 400A (at stations where Line Isolating-Units No. 1A are fitted), in addition. These units maintain the d.c. insulation yet permit the passage of carrier frequency. See Works Specification WB 734 and Dgm WBW 28295.

11 **LABELS AND INSTRUCTION BOOKLET** The following labels should be obtained from the Purchasing and Supply Dept (PR4/1) 91-99 Pentonville Road, London NI on requisition P1056G.

(a) Labels A3707 which, inscribed with the warning district name shown on the Advice Note, should be fitted in the right-hand label holder.

(b) Label A3708 which should be fitted in the left-hand label holder. An instruction booklet, to be kept in the receiver tray will be issued to the subscriber by the Chief Constable.

Formerly EI Misc, General, Q1088
(TMkD/TMk2.6) E N D