multitone

CS 600

INSTALLATION &

ENGINEERING GUIDE

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CONTENTS

EFFECTIVE PAGE LIST

Page No.	Issue	Page No.	Issue	Page No.	Issue
(I)	1	4-7	1	7-5	1
(ii)	1	4-8	1	7-6	1
(iii)	1	4-9	1	7-7	1
(iv)	1	4-10	1	7-8	1
(v)	1	5-1	1	7-9	1
(vi)	1	5-2	1	7-10	1
1-1	1	5-3	1	7-11	1
1-2	1	5-4	1	7-12	1
1-3	1	5-5	1		
1-4	1	5-6	1		
1-5	1	5-7	1		
1-6	1	5-8	1		
2-1	1	5-9	1		
2-2	1	5-10	1		
2-3	1	5-11	1		
2-4	1	5-12	1		
3-1	1	6-1	1		
3-2	1	6-2	1		
3-3	1	6-3	1		
3-4	1	6-4	1		
3-5	1	6-5	1		
3-6	1	6-6	1		
4-1	1	6-7	1		
4-2	1	6-8	1		
4-3	1	7-1	1		
4-4	1	7-2	1		
4-5	1	7-3	1		
4-6	1	7-4	1		

SAFETY SUMMARY

The following information applies to both operating and servicing personnel. General Warnings and Cautions will be found throughout the manual, where they apply, which refer to the applicable part of this summary.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION statements identify conditions or practices that could result in equipment damage.

CAUTION

STATIC SENSITIVE DEVICES ARE USED WITHIN THIS EQUIPMENT. CARE MUST BE TAKEN WHEN HANDLING THESE DEVICES AS THEY MAY BE DAMAGED BY HIGH LEVELS OF STATIC ELECTRICITY.

INSTALLATION - TYPE APPROVAL

The following information should be noted and adhered to, in order to ensure continued compliance with the type approval regulations, pertaining to the connection of this equipment to Telecom circuits.

The telephone line interfaces of the CS 600 have been tested and approved for connection to a PABX/PBX analogue port, with no direct access to the Public Network (PSTN).

Any direct connection to the Public Network should therefore not be attempted.

PTO Circuit Connection

The CS 600 Inter-Working Unit (IWU) interface is designed to operate on the following Public Telecommunication Operator (PTO) circuits:

PABX   2/3 Wire Analogue Extension Access; DTMF signalling and speech; Earth, or Time-break Recall.

Use of the equipment should be restricted to circuits providing these facilities only.

Interface wiring from any exchange to the PABX demarcation socket, is to be supplied by the recognised PTO, the designated Private Automatic Branch Exchange (PABX) maintainer, or their accredited representative.

Operation and installation of this equipment should be in strict accordance with the conditions contained within this manual. Any other usage will invalidate the approval of this apparatus if, as a result, it ceases to conform with the standards on which approval is based. For the latest information, please consult Multitone Electronics plc.

Under no circumstances should this equipment be used as an extension to a payphone installation.

Ringer Equivalence Number (REN) - Extension Access Only

The Ringer Equivalence Number (REN) number assigned to an equipment, enables the determination of the number and type of other equipments which may be connected in the same Telecom Extension Line, without causing detrimental operation. The REN number for each port of the CS 600 IWU, is '1'.

SECTION 1

CS 600 INTRODUCTION

CONTENTS:

INTRODUCTION

FUNCTIONAL REQUIREMENTS

SYSTEM FEATURES
Multitone CS 600 System
CCFP facilities
CCFP IWU

INTRODUCTION

The CS 600 system complies with the DECT standard for digital cordless telephony operating in the range of 1.8 - 1.9GHz.

The CS 600 system satisfies the following objectives:

- offers a cordless telephone capacity within a limited geographic area.

- makes it possible to build up local cordless telephone systems in the same way as wired PABX's are used today, but with the significant differences that the telephone handset installation does not require cables, and the cordless system gives the user full mobility within the given area. The CH 60 can be described as a personal pager and a mobile telephone in one package.

- enables the system to be tailored to cover only the required area.

- allows data and speech to be handled using the same digital transmission techniques. The CS 600 system also provides features common to ISDN and GSM systems.

- conforms to the GAP standard for signalling and supports the telephone functions of DECT handsets manufactured by independent producers.

- allows system coverage to be extended in accordance with the user's needs.

The DECT system described in this specification is designed to extend existing PABX installations.

The CS 600 system comprises the following (refer to Figure 1) :

- Cordless handset(s) (PP)

- One (or more) base stations (RFP) and

- A control unit (CCFP) incorporating an interface unit (IWU). The IWU interface unit can interface with the existing PABX.

The CCFP can be considered as transparent to the PABX which means that the user may have the same telephone number on a cordless telephone as allocated to an existing corded telephone (effectively adding mobility to the corded telephone). Furthermore, all PABX features available to an analogue telephone can be accessed from a handset. Besides the built-in facilities in the PABX, the CS 600 system offers a number of features.

The CCFP can be extended by adding IWUs each having a capacity of eight local analogue connections, to give a maximum of 64 analogue telephone connections on the same installation.
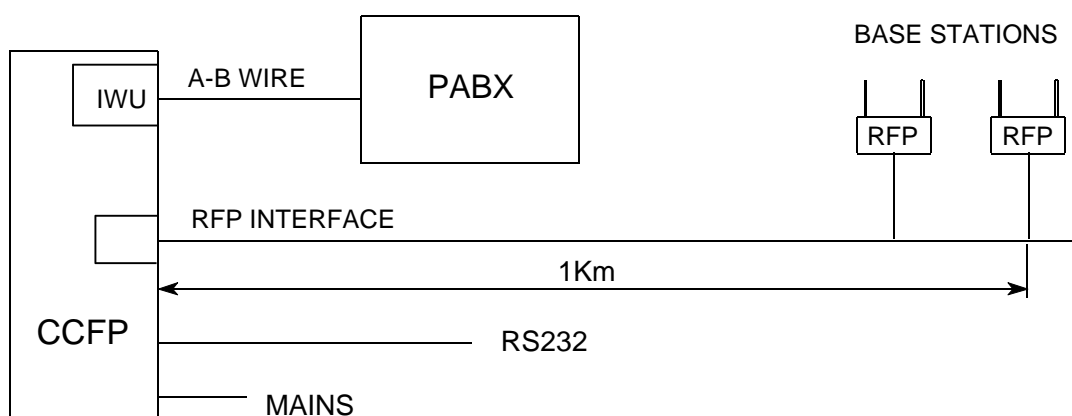
HANDSETS
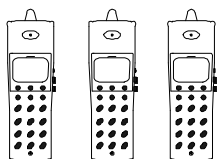
SINGLE CHARGER   MULTI CHARGER

BASE STATIONS

IWU

A-B WIRE   PABX

RFP   RFP

RFP INTERFACE

1Km

CCFP

RS232

MAINS
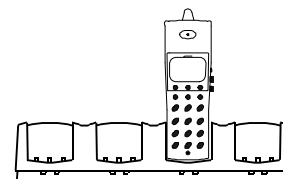
TAG11150-1

Figure 1: CS 600 Cordless System

FUNCTIONAL REQUIREMENTS

The CS 600 system is connected to the PABX using analogue wires. A data line may be connected to the CCFP Data Port thereby permitting the user to communicate using the Multitone text facilities built into the system.

The base stations can be sited up to a cable distance of 1km from the CCFP. Each base station covers a radius of 50 to 600m depending on buildings etc, within the area. The base stations are connected to the CCFP using standard two-core telephone wires. This provides both power and full duplex transmission between the CCFP and the base stations.

SYSTEM FEATURES

Multitone CS 600 System

The Multitone CS 600 system provides the following features:

- adherence to the DECT/GAP specifications.
- handover within the same base station.
- handover between base stations.
- two-wire connection to the base stations.
- CS 600 frame synchronisation between the base stations.
- speech channel encryption.
- coverage up to 600m (line of sight).

CCFP facilities

The system control unit (CCFP) provides the following features:

- up to 64, CS 600 connections to PABX.
- text messaging facilities from the Data Port to CS 600 handsets.
- local calling ID when calling between CS 600 handsets.
- B-answer facility (automatic off-hook) of CS 600 handset.
- data communications for programming and text messaging from a PC/LAN.

CCFP IWU

The CCFP interworking unit (IWU) provides the following features:

- analogue PABX interface.
- ringer receiver.
- DTMF sender.
- PULSE sender.
- DTMF receiver.
- tone receiver.
- earth and time break recall.
- timer programming.

SECTION 2

CONTROLLER OVERVIEW

CONTENTS:

CENTRAL CONTROL FIXED PART (CCFP)

Role

The CCFP is the central control unit in the CS 600 system. The CCFP interfaces with and controls the base stations and PABX interface cards.

List of CCFP Features

The CCFP exhibits the following features:

- provision for up to 64, CS 600 connections to PABX.
- support for up to 16 base stations (RFP).
- text messaging applications.
- CS 600 calling line ID feature.
- auto-answer feature.
- external data/paging and set-up via the Data Port.

CS 600 Connections

The CCFP maintains a subscriber table for holding information as to which a/b connection each handset belongs. It is possible to assign a name of up to 10 characters to each number. This table is configured via the Data Port.

The CCFP and the Interworking Unit (IWU) are internally connected by means of two 2Mbit bi-directional buses: one for speech (PCM), and the other for data. The CCFP and the IWU communicate via the data bus. The CCFP is responsible for providing the clock signals (4MHz and 8kHz) used by the IWU for the synchronous serial transmission of speech and data.

The CS 600 system has a capacity to handle up to eight IWUs, thus providing a total of 64 lines. Each IWU is assigned a number in the range 0 to 7. Units 0-3 are connected to PCMbus1, whilst units 4-7 are connected to PCMbus2. All units share one common databus.

Base Station Interface

The CCFP can handle up to 8 base stations. The base stations are connected to the CCFP via a 2-wire connection which carries both DC supply and audio/data transmission. The CCFP can operate the base units over line lengths up to 1 km on 0.5mm copper wire. The transmission rate is 160kbit/s: equal to four simultaneous speech/data channels, 1 signalling channel and various synchronisation signals. By adding an expansion card to the CCFP, the system capacity may be increased to 16 base stations.

Text Message Feature

The CCFP has a text message facility through the Data Port. Messages from the Data Port, or an external application, can be sent to the handset; similarly, key pad signalling from the handset can be sent to the CCFP or external application.

DECT Call Line ID Feature

When calling between the CS 600 handsets, the CCFP transmits the extension number, and name of the calling subscriber. This data is stored in the subscriber table. If called from an external telephone, 'Incoming Call!' will be displayed.

Auto-Answer Feature

The auto-answer feature uses the IWU card to detect on-hook.

External Data and Set-Up via the Data Port

The CCFP has a Data Port for service, installation and communication purpose.

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SECTION 3

BASE STATION OVERVIEW

CONTENTS:

1. RADIO FIXED PART (RFP) - BASE STATION
2. List of RFP Features
3. Functional Features of the RFP
6. Mechanical Requirements for RFP
7. Electrical Requirements for RFP

8. BASE STATION INSTALLATION
9. Installation

RADIO FIXED PART (RFP) - BASE STATION

For any system, one or more RFP (Base Stations) are installed as required throughout the site, to ensure uniform coverage by the system, in accordance with the deployment record.

List of RFP Features

The RFP exhibits the following features:

- 10 RF channels.
- four active speech traffic channels.
- antenna diversity.
- frame synchronising via the CCFP.
- two-wire duplex connection to the CCFP.
- four 32 kbit/s traffic channels.
- powered by the CCFP via the two-wire a/b signal lines.
- operated up to 1km cable length from the CCFP.

Functional Features of the RFP

The RFP has a capacity of 10 RF channels, and is able to address six time slots in each RF frame. The RFP can perform handovers between the RF channels under the same RFP, and is able to handle four speech channels.

An RFP is able to perform frame synchronisation with other RFPs which are controlled by the same CCFP.

The RFP is designed with two antennas and can support antenna diversity.

Mechanical Requirements for RFP

The outline view of the Base Station is shown in Figure 1.
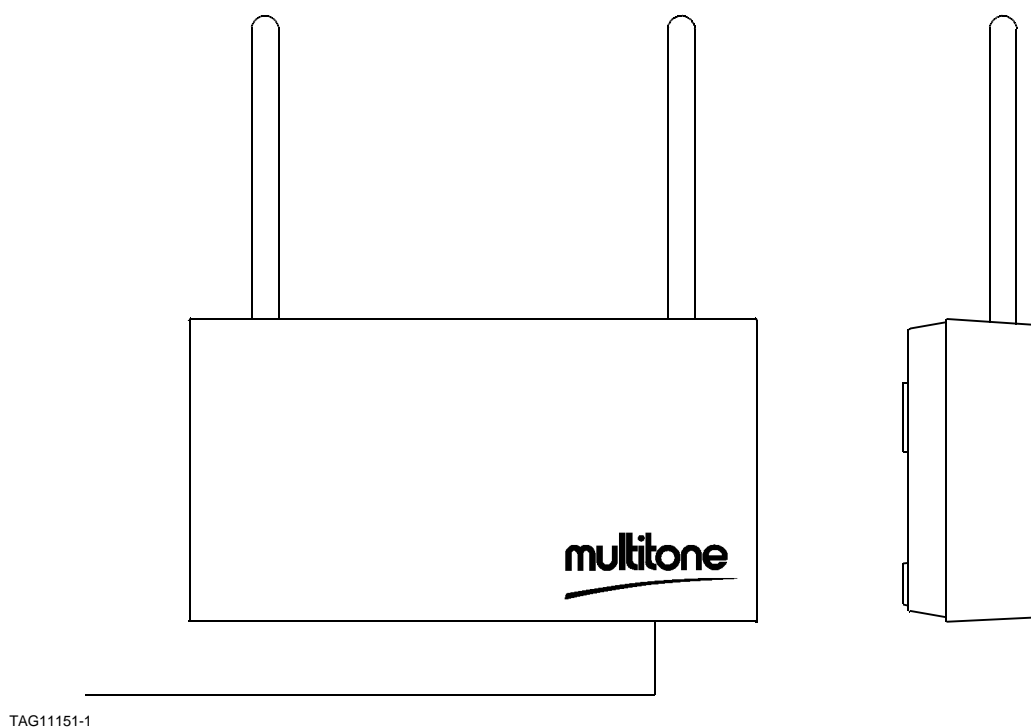
Figure 1: Base Station Outline View

TAG11151-1

Electrical Requirements for RFP

Power supply: The RFP is powered by the CCFP via the a/b signal lines.   Maximum supply requirement, 1.5W.

CS 600 range: Maximum 600 metres (line of sight) with a CH 60 handset.

BASE STATION INSTALLATION

Base stations are located in accordance with the Deployment Record.

Installation

Position and install the base stations as follows:

a)   When mounting base stations on a metal surface, a 4" (100mm) minimum   standoff with a timber mounting MUST be used. Refer to Figure 2.

b)   After determining the location, identify a suitable mounting surface and mark the drilling positions as shown in Figure 3.

mounting board

THIS GAP SHOULD
BE AS LARGE AS POSSIBLE.

**STEEL I
SECTION BEAM**

mounting board

THIS GAP SHOULD
BE AS LARGE AS POSSIBLE.

BASE STATION MAY BE MOUNTED ON A BOARD AND
OFFSET TO ONE SIDE OF THE PILLAR PROVIDED THE
CUSTOMER IS SATISFIED

**STEEL I
SECTION BEAM**

CS 600 Base
Station

RJ11

150 mm

Connecting
Box

BASE STATION

Base Stations must stand clear of any metal surfaces
by at least 100mm (4"")

TAG11152-1

Figure 2: Base Station Mounting Details

6mm dia

130mm
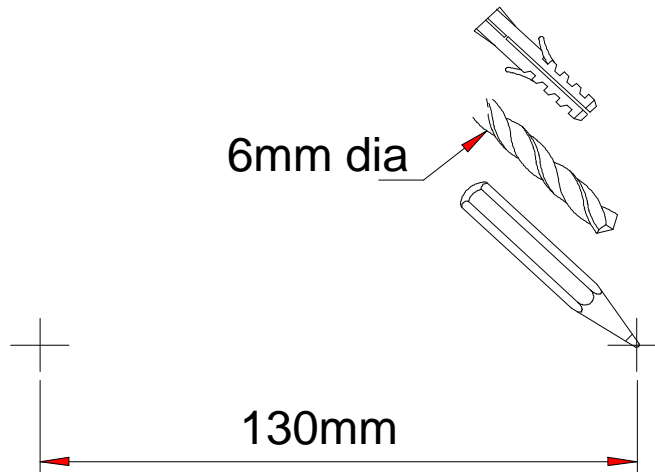
TAG11153-1

Figure 3: Base Station Marking-out Details

c)   Using a 6mm diameter bit, drill and plug two holes. Fit two screws as shown in Figure
4 ensuring that the screw heads remain proud by 5mm.
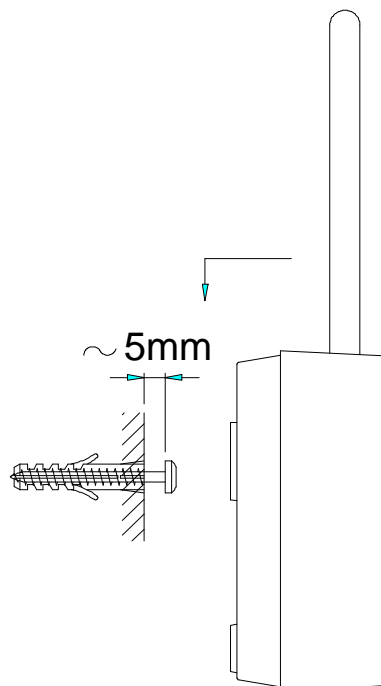
TAG11154-1

Figure 4: Base Station Fitting Details

d)   Mount the Base Station on the 2 screws.

e)   Connect the a/b wires from the CCFP to the connecting box on terminals 3 and 4 and using the RJ11 lead to the bottom of the Base Station. Use the 2 inner connectors of the plug. Terminate the a/b wires.

Base Station

Terminations are to 3 and 4 in the connecting box. The connector is wire displacement and requires a special tool for insertion.

100 mm

Connecting Box

Base station connecting cable pair

RJ 11 connectors

Base Station

0.5mm twisted pair

100mm
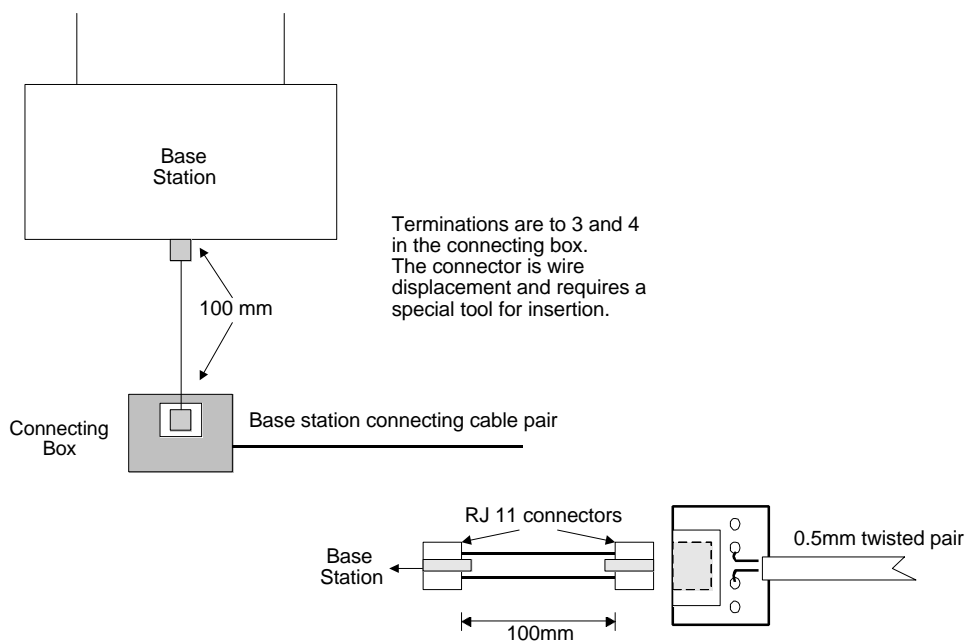
TAG11155-1

Figure 5: Base Station Connection Lead

f)

Repeat steps 'a' to 'd' for each Base Station.

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SECTION 4

CS 600 INSTALLATION AND COMMISSIONING

CONTENTS:

INSTALLATION OVERVIEW

CONTROLLER HARDWARE CONFIGURATION
Installation of IWU
Installation of Base Station Extension Board

CONNECTION CABLING DETAILS
Controller/Data Port Connection Cable
Base Station/IWU Connection Cable

MOUNTING THE CCFP
Dimensions and Fitting of the Mounting Plate

CAUTION

STATIC SENSITIVE DEVICES ARE USED WITHIN THIS EQUIPMENT. CARE MUST BE USED TO ENSURE DAMAGE TO THESE DEVICES IS NOT CAUSED BY HIGH LEVELS OF STATIC ELECTRICITY.

INSTALLATION OVERVIEW

The following list itemises the steps which need to be taken when installing a CS 600 system.

a) Install Interface Cards into the IWU and RFP expansion slots in the CCFP.

b) Fix the CCFP to a wall or place it on a suitable flat surface within 3 metres of the demarcation point or main distribution frame and within two metres of the mains power point.

c) Terminate the cables.

d) Mount the Base Stations and connect the signal/power cables to the CCFP. Enclosures must be correctly fitted with all apertures sealed to prevent the ingress of water, gas, dust etc.

e) Power-up the system and load the flash program, if required.

f) Perform the cable measurements and ensure that all Base Stations are working.

g) Enter the system data and load it into the CCFP. Complete the CCSMAN3 records.

h) Register the handsets and test for transmission, transfer and reception of calls.

i) Walk the site with 3 handsets switched to RSSI mode and check for radio coverage and handoff.

j) Train the system administrator and users.

k) Test the remote access facility where this is provided as part of the system

l) Ensure that all documentation is completed and left in a secure location.

m) Retain a copy of the site data.

CONTROLLER HARDWARE CONFIGURATION

Installation of IWU

The IWU card is installed in the CCFP as follows:

a) Ensure that the CCFP is switched off and disconnected from the mains.

b) Loosen the four screws on each side of the CCFP and remove the four cover fixing screws (labelled 1 to 4 in Figure 1) from the rear panel. Place the screws to one side for safe keeping. Lift off the top cover.
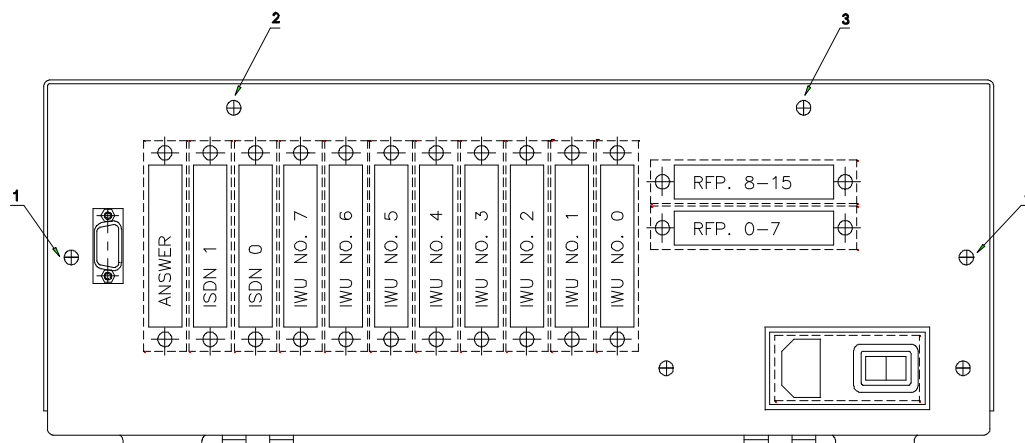
TAG11156-1

Figure 1: CCFP Rear Panel

c)   Remove the blanking plate from the first free IWU slot from the right.

> ***NOTE:***   *The blanking plate is a metal pressing. To remove it, insert the blade of a screwdriver between the blanking plate and rear panel and, whilst twisting the screwdriver anti-clockwise, give the plate a sharp tap.*

d)   Insert the IWU card in the vacant slot and secure it with the screws provided.

e)   If further IWU cards are to be fitted, repeat items c & d above until all cards are installed.

f)   If no other cards are to be fitted, refit the top cover and replace all screws. If an RFP expansion board is to be fitted, refer to paragraph 3.

g)   Connect the DP25 plug on the IWU cable to the corresponding socket on the rear of the CCFP. Connect the other end of the IWU cable to the PABX DEMARCATION socket. The typical wiring diagram for a 50-pair demarcation Krone box is shown in Figure 2. The corresponding drawing for a 100-pair box is shown in Figure 3.

h)   Power-up the CCFP.

Outgoing cables to Base Stations.
1 pair only power and speech
1 pair spare. Base Stations 1 - 8
and 9 - 16.

1 to 8

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Base station wiring for 16
Base Stations.
Incoming cables from radio
controller

9 to 16

| 11 | 1 2 | 1 3 | 1 4 | 1 5 | 1 6 | 1 7 | 1 8 | 19 | 20 |

Lines 1 - 8 and earth
recall if required.
One earth per port
Refer to wiring diagram
(Figure 10)
Two strips per 8m users

| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

Cable or
jumpers to
analogue
lines on
MDF.

Lines 9 - 16 and earth
recall as required
maximum of 8 interface
cards

| 31 | 32 | 33 | 34 | 3 5 | 3 6 | 3 7 | 3 8 | 39 | 40 |

| 4 1 | 4 2 | 4 3 | 4 4 | 4 5 | 56 | 47 | 4 8 | 49 | 50 |

Cable to
radio
controller

TAG11157-1

Figure 2: Wiring Diagram for a 50-Pair Demarcation Krone Box

PABX

MDF

PABX extensions

Cable to main MDF

Jumper to cordless

Cordless Krone connection

Drawing 1

Cables from PABX / MDF terminate
in the top Krone strips.
PABX maintainer to provide jumpers or cable
from PABX analogue extensions, with each
extension labelled.

Provision of the 100 pair Krone box
and strips is optional. If not supplied
advise your Multitone account manager.

Jumpers terminate on the bottom.
Multitone engineer provide.

TAG11158-1

Figure 3: Wiring Diagram for a 100-Pair Demarcation Krone Box

Installation of Base Station Extension Board

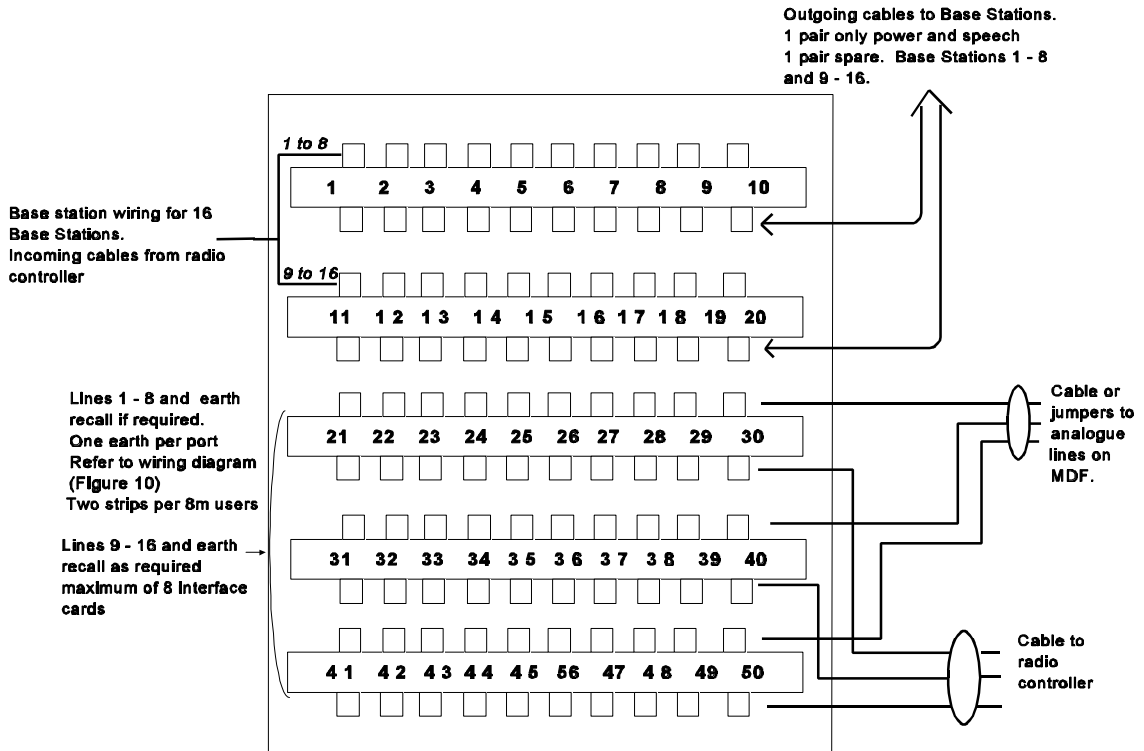The RFP extension board should be installed as follows:

a)   Ensure that the CCFP is switched off and disconnected from the mains supply.

b)   Loosen the four screws on each side of the CCFP and remove the four cover fixing screws (labelled 1 to 4 in Figure 1) from the rear panel. Lift off the top cover.

c)   Insert the 2 plastic pins in the main board (refer to Figure 4) and fit the RFP extension board ensuring that the pins engage in the corresponding holes in the extension board.

TAG11159-1
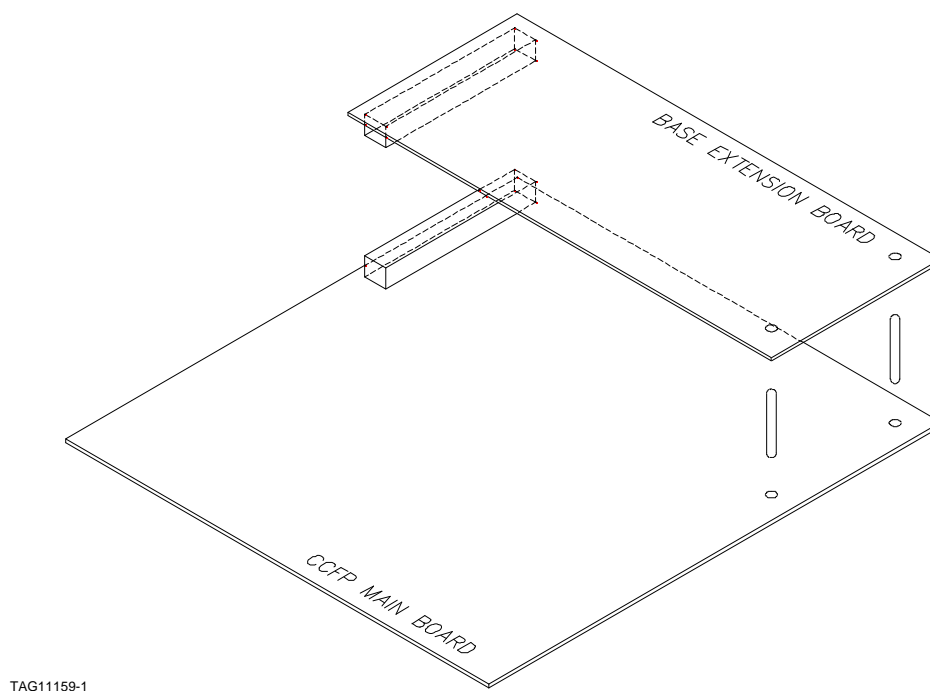
Figure 4: Mounting the RFP Extension Board

d)   Remove the cover plate from RFP 8 - 15 as shown in Figure 5.
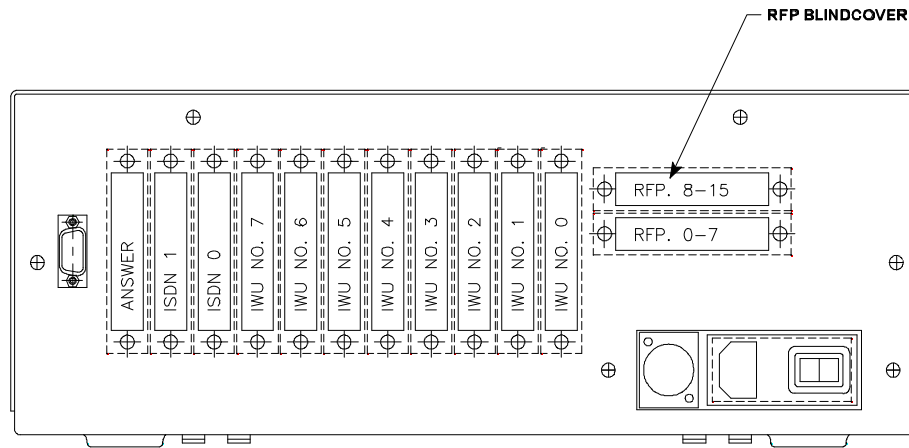
TAG11160-1

Figure 5: Position of FRP 8 - 15 Cover Plate

e)   Mount the internal cable by fitting the DP25 connector in place of the cover plate (removed in item d above) and securing it using the two screws provided. Connect the other end of the cable to the RFP extension board.
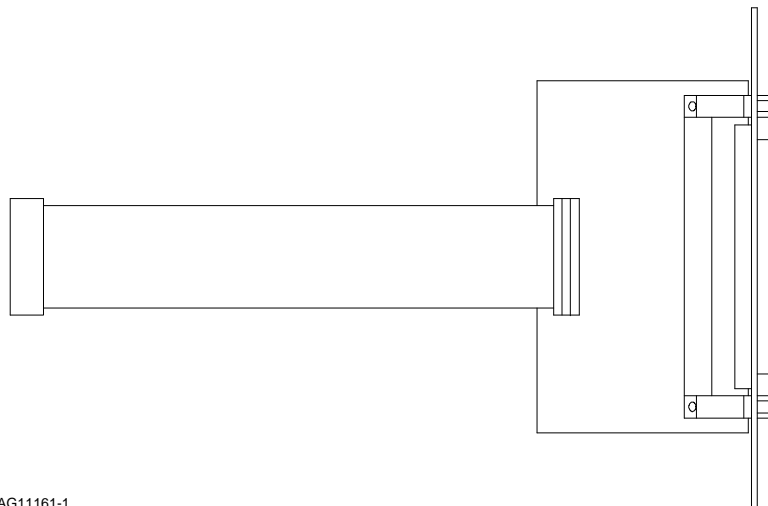
TAG11161-1

Figure 6: RFP Internal Cable

f)   Refit the top cover. Replace and tighten all of the screws.

g)   Connect Base Stations 8 to 15 via the 25-way cable to the RFP expansion board.

h)   Ensure that the remote base stations are properly installed.

I)   Power-up the CCFP.

CONNECTION CABLING DETAILS

Controller/Data Port Connection Cable

The cable pinning details for the Controller/Data Port connecting cable are shown in Figure 7.

Base Station/IWU Connection Cable

The cable pinning details for the Base Station/IWU connecting cables are shown in Figures 8 and 9.

NOTE: *The Base Station and IWU User Line cables should be terminated at the demarcation points.*
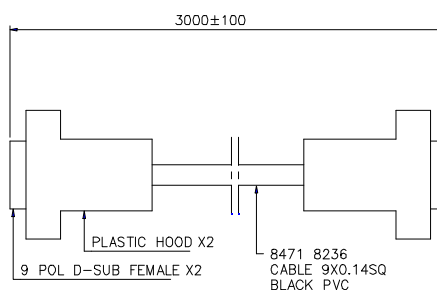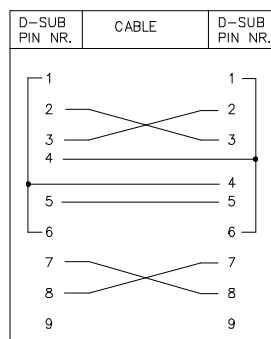
Figure 7: Controller/Data Port Connection Cable
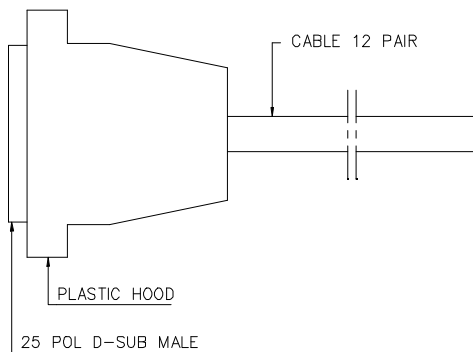
D−SUB PIN NR.	COLOUR	BASE
1	WHITE/BLUE	0 A
14	BLUE/WHITE	0 B
2	WHITE/ORANGE	1 A
15	ORANGE/WHITE	1 B
3	WHITE/GREEN	2 A
16	GREEN/WHITE	2 B
4	WHITE/BROWN	3 A
17	BROWN/WHITE	3 B
5	WHITE/GREY	4 A
18	GREY/WHITE	4 B
6	RED/BLUE	5 A
19	BLUE/RED	5 B
7	RED/ORANGE	6 A
20	ORANGE/RED	6 B
8	RED/GREEN	7 A
21	GREEN/RED	7 B
9	RED/BROWN	NC
22	BROWN/RED	NC
10	RED/GREY	NC
23	GREY/RED	NC
11	BLACK/BLUE	NC
24	BLUE/BLACK	NC
12	BLACK/ORANGE	NC
25	ORANGE/BLACK	NC

CABLE 12 PAIR

PLASTIC HOOD

25 POL D−SUB MALE

TAG11163-1

Figure 8: Base Station Connections
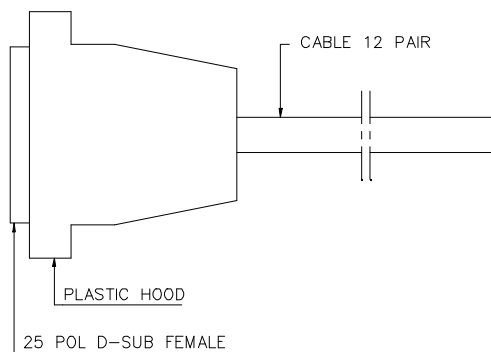
D−SUB PIN NR.	COLOUR	LINE
14	WHITE/BLUE	0 A
1	BLUE/WHITE	0 B
15	WHITE/ORANGE	1 A
3	ORANGE/WHITE	1 B
2	RED/GREY	0 EARTH
16	BLACK/ORANGE	1 EARTH
17	WHITE/GREEN	2 A
4	GREEN/WHITE	2 B
18	WHITE/BROWN	3 A
6	BROWN/WHITE	3 B
5	GREY/RED	2 EARTH
19	ORANGE/BLACK	3 EARTH
20	WHITE/GREY	4 A
7	GREY/WHITE	4 B
21	RED/BLUE	5 A
9	BLUE/RED	5 B
8	BLACK/BLUE	4 EARTH
22	RED/BROWN	5 EARTH
23	RED/ORANGE	6 A
10	ORANGE/RED	6 B
24	RED/GREEN	7 A
12	GREEN/RED	7 B
11	BLUE/BLACK	6 EARTH
25	BROWN/RED	7 EARTH

CABLE 12 PAIR

PLASTIC HOOD

25 POL D−SUB FEMALE

TAG11164-1

Figure 9: IWU User Line Connections

MOUNTING THE CCFP

The CCFP may be either wall or desk-mounted, as required. Where the unit is to be wall-mounted, the mounting bracket which is supplied with the unit should be used as a template. If the unit is desk-mounted, nothing should be placed on top of the unit.

The CCFP must be sited within 2 metres of a 230V mains supply and within 3 metres of a demarcation box. To allow for future expansion, the cables should be positioned under the CCFP. Refer to Figure 10.

KRONE BOX

CCFP

230V AC MAINS

3 METRES

2 METRES OR LEAD LENGTH

SPACE FOR CABLES 10" (250mm)

TAG11185-1
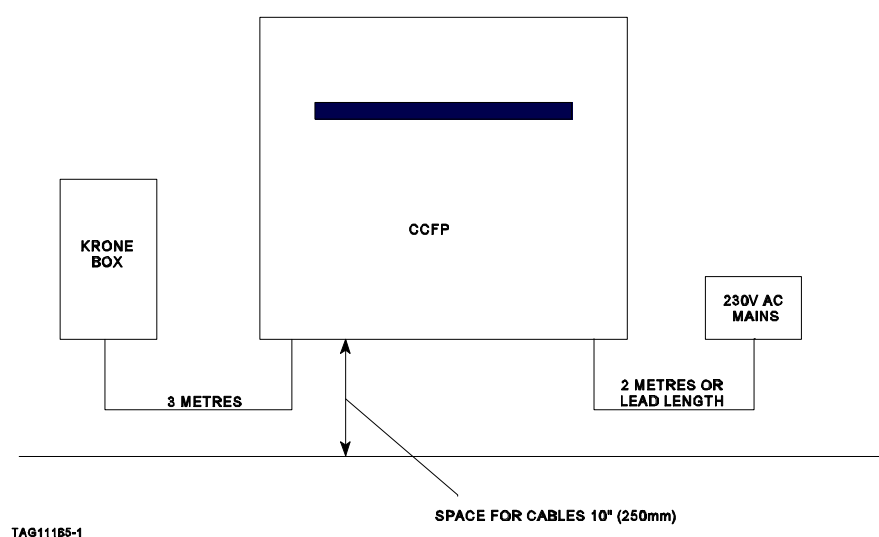
Figure 10: CCFP Siting Details

Dimensions and Fitting of the Mounting Plate

The CCFP mounting bracket is shown in Figure 11. When fitting, the bracket should be horizontal and at least 250mm (10") clear of other objects.

TAG11166-1
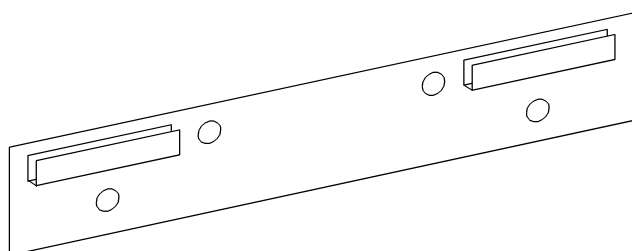
Figure 11: CCFP Mounting Bracket

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SECTION 5

CS 600 DEMONSTRATION/DEPLOYMENT USER GUIDE

CONTENTS:

INTRODUCTION
Deployment Guide Notes
Demonstration Tool
Deployment Tool
Setup for Deployment

HOW TO REGISTER/SUBSCRIBE TO A HANDSET
Registration/Subscription Procedure
Fault Finding

USING THE UNIT FOR DEMONSTRATION

HOW TO USE THE DEPLOYMENT TOOL
Preparation
Resetting the Handset
External Enclosures

CELL MEASUREMENT
Cell Overlap

MEASUREMENT RADIO COVERAGE

PLACEMENT OF BASE STATIONS

BASE STATION POSITIONING

INTRODUCTION

The demonstration/deployment tool is a portable CS 600 base station, that may be battery or mains powered. The unit is used as a radio base station survey tool when installing a CS 600 system or for the demonstration of CS 600 equipment.

Deployment Guide Notes

The following notes should be considered for all deployments. Any anomalies or special requirements should be recorded on the deployment record.

a)   The radio coverage is assumed to be site-wide. The number of Base Stations is limited to 16. When taking measurements of the Base Station cell, it is essential that there is an overlap between cells of 1 to 15 metres using the Q52 and RSSI measurement lower limits of 52 and 40.

b)   Where an enclosure is to deployed, allowance must be made for the reduction in signal strength because of the housing.

c)   The customer must confirm that coverage is required in the following areas. Where coverage is not required, a record of the uncovered areas must be made.

- Car parks and boundaries.

- Fridges and freezers. An enclosure may be required.

- Security huts at or near entrance gates.

- Strongrooms and vaults with reinforced steel walls.

- High storage racking.

d)   The Base Station will support four simultaneous voice calls. Consideration should be given to any location where cordless users can congregate. For example:

- Meeting Rooms

- Cafeteria and rest rooms

- Areas where cordless users may congregate under emergency conditions.

e)   When deploying a site in which the environment is hazardous to the user, handset or fixed equipment, consideration must be given to the customer's use of the equipment. In some environments, the equipment will require additional protection.

- Heavy industry and manufacturing - Holsters and handsets with a vibrate alert facility.

- Corrosive gas or liquids - Base Station enclosure and handset protection.

- Water, moisture, vapour or where rapid change in temperature may cause condensation to form.

- Base Station enclosure and handset protection.

- Temperature

  Below -10 degrees   Base Station enclosure.
  Below -15 degrees   Base Station enclosure and thermostatic heating.

- Extreme noise - Handset with a vibrate alert facility and which must be housed close to the body.

- Both hands free for control of machinery - Standard or ear defender headset.

- Explosive gas, dust or other materials - Equipment must not be installed in these areas

  NOTE: *Multitone does not offer an intrinsically safe headset or Base Station enclosure.*

Demonstration Tool

The equipment comprises a handset, single charger, demonstration base station unit and cable for connecting to an analogue telephone extension. The unit is housed in a carrying case.

The equipment may be used to make and receive a call via the customers PABX, and, if two handsets are registered, a call may be made between handsets.

NOTE: *In some cases the handset may not ring. This is determined by the issue level of the handset software. In such cases, demonstrations of the ringer volume and ringer options may need to be made separately.*

Deployment Tool

The deployment tool includes the items used in the demonstration unit and, in addition, a rechargeable battery and charger unit, tripod with mounting bracket for the base station, three metre coiled telephone cable and a tape unit for audio input.

Miscellaneous items include batteries, deployment records and marker pens for plans.

Using the deployment tool it is possible to measure the received signal strength (RSSI), data quality and audio performance to the registered handset.

The optimum location for a base station may be identified and marked before surveying the next base station to ensure that cell boundaries overlap for handoff, and that all areas specified by the customer have radio cover.

NOTE: *The RSSI, Q figure and audio quality measurements MUST lie within the following specified limits:*

       RSSI   40 - 64
       Q52   52 - 64 (and stable)
       Audio   Clear Speech

Setup for Deployment

The Base Station is connected to the battery via a dual-purpose coiled cable that carries both DC power and audio.

The Base Station is mounted on the lugs at the end of the extension arm. The audio tape unit is connected to the dual-purpose cable using the DIN connector provided.
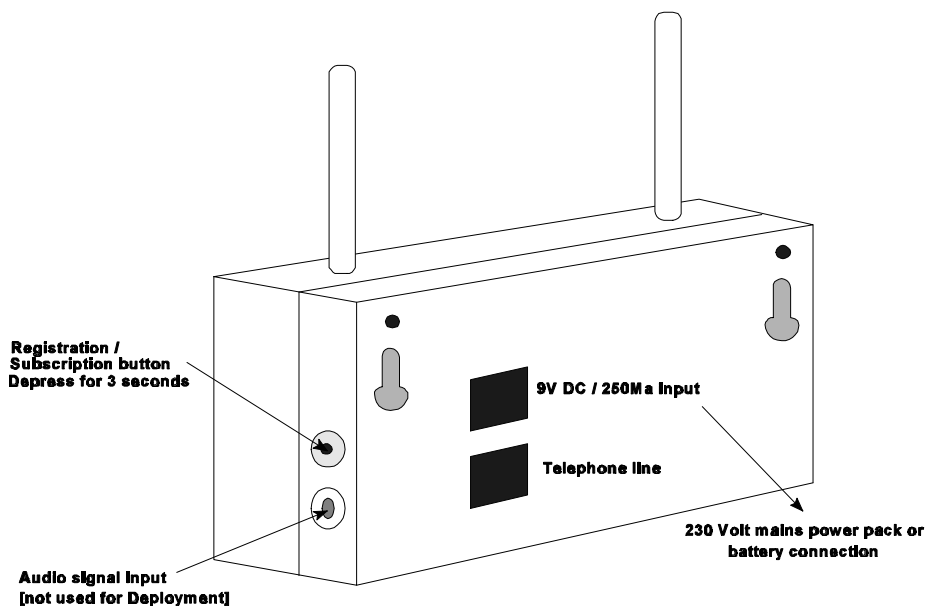
Figure 1: Base Station Connections

HOW TO REGISTER/SUBSCRIBE TO A HANDSET

Note that both CS 600 terminology and CT2 terminology for registration of the handset have been duplicated throughout.

Please refer to the handset user guide for additional information on registration/subscription and the removal of a handset from one or more systems. A maximum of eight handsets can be subscribed to a Deployment Base Station. The registration/subscription is stored when powered-down.

Registration/Subscription Procedure

This procedure is used for both the demonstration and deployment units.

The procedure details the method for registration of a new, previously unregistered handset. If the handset has been previously registered, the original registration must first be removed or an alternative 'login slot' selected between one and four, from the Login Setup menu.

Handsets with software version 3C or later may register the extension number by entering the sequence "*99972*x" - where 'x' = extension 1-8.

Press ENTER before registration.

The following procedure is for registering a handset.

Connect the Base Station to power. Turn on the handset by pressing and holding the ENTER button.	DECT-CH 60
Press MENU	MENU SETUP
Press ENTER	SETUP RINGER
Press the right arrow button >>> (3 times)	SETUP SUBSCRIBE
Press ENTER. Press the Base Station Registration/Subscription button for 3 seconds and then release	SUBSCRIBE CREATE

Press ENTER.
The handset will search for ANY DECT system that has subscription enabled and display the system ID in the display. Use the < > buttons to search for the system ID number, matching that shown on the rear of the RFP unit.

Press ENTER.
Use the < and > buttons to scroll between system 1-4, and enter the AC = 12345678, and press ENTER.

The symbol ((•)) will appear if the subscription is successful.

SUBSCRIBE SEARCH ID: <00002200045>

CREATE SYSTEM 1 AC: _____

DECT-CH 60   ((•))
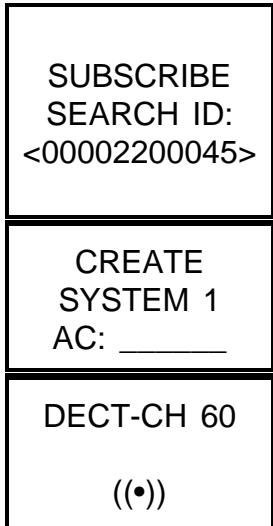
The message 'Subscribe Failed' will indicate that the Base Station is not turned on, the subscribe button has not been pressed, or that the registration slot is not empty. Alternatively, the handset may have been registered to another system. If necessary, repeat the process.

Check that the handset's 'login' has a * against an empty system.

Fault Finding

Where difficulty is found when using the Deployment Kit to perform a registration, the following aspects should be checked:

● Registration button was not pressed for 5 seconds.

● Subscription slot is already in use.

USING THE UNIT FOR DEMONSTRATION

Connect the Base Station to a mains supply via the adaptor lead provided, and switch on.

Plug the telephone cable into an analogue extension jack point.

With the handset switched on, the ((•)) symbol should appear in the display indicating that the handset and Base Station are active and communicating. If not, check that the handset is registered, logged-in to the correct system and the mains power is connected to the demonstration unit.

The ringer volume and ringer options may be demonstrated using the handset programming.

Where two handsets have been registered the calling number is preceded by an "R", for example R2 then off hook from handset 1 will call handset 2.

HOW TO USE THE DEPLOYMENT TOOL

Preparation

Connect the deployment tool as shown in Figure 2 and configure the equipment as follows:

● Connect the coiled telephone cable, the RJ45 and DIN plugs to the base station power and audio inputs.

● Mount the Base Station on the tripod mounting plate.

● Connect the battery. Ensure that the tape unit batteries are in good condition, tape unit.

● Turn on the as the audio may otherwise be distorted, or of poor quality.

● Connect the handset and fit the headset.

● Enter the number sequence for RSSI "*99981*" and press ENTER.

- Turn on the tape and press the off hook button on the handset. Check the audio for clarity.

- The display will show: RPN:XX   -   Base Station number
  Q52:64   -   Data quality (No. Between 52 and 64 (and stable))
  RSSI:64   -   Received signal strength.

Headset

multitone

RSSI, Signal and audio measurements

Tripod Arm

Base Station

Adjustable tripod

Audio Input

Battery
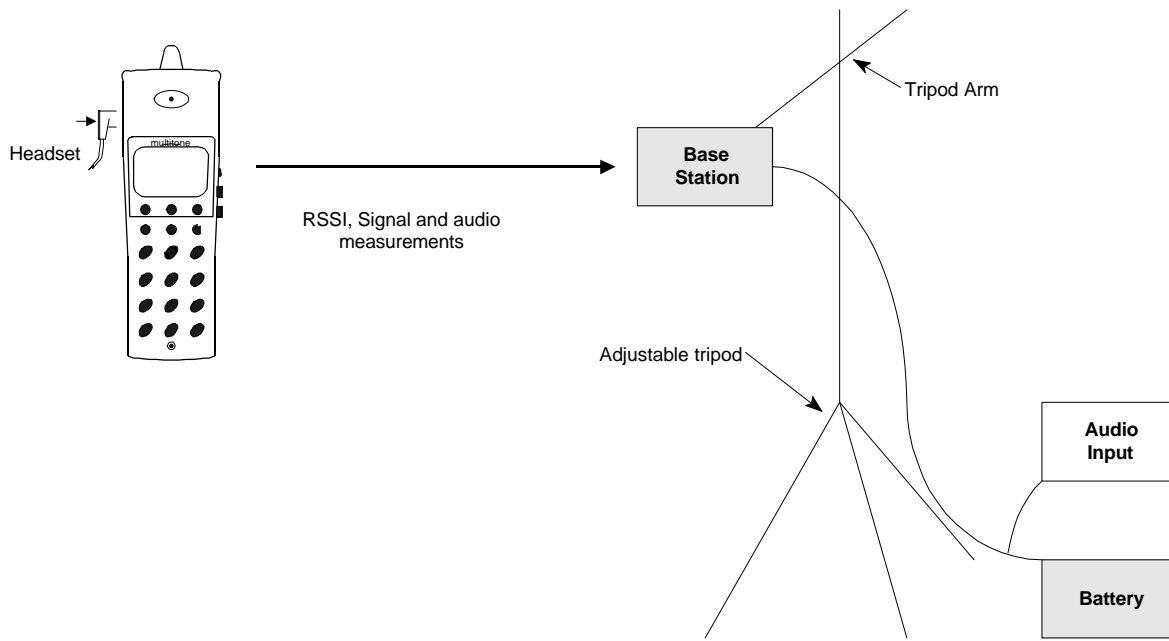
TAG11168-1

Figure 2: Base Station Deployment Equipment Setup

Place the Base Station in the required position and move away taking careful note of the Q52 and RSSI readings whilst listening to the audio quality.

The lowest permitted reading for Q52 is 52. (This figure must be stable).
The lowest permitted reading for RSSI is 40.
The audio must be clear at all times with no breakup.

NOTE: *The readings are not related and any one may reach a critical level whilst another is good. This is still the edge of the cell boundary.*

As soon as any reading or the audio becomes unacceptable, the edge of the cell boundary has been reached and MUST be marked on the plans. There MUST be adequate overlap of each cell.

The process for deployment is otherwise similar to that for CT2, and the same rules must be followed.

Resetting the Handset

To clear the handset display, press and hold the < arrow key for two seconds.

External Enclosures

External enclosures may not be specified for CS 600 systems. Where no information is provided, reference should be made to recent Product Information documents for details of installation and operating conditions.

CELL MEASUREMENT

Cell Overlap

In any installation, a certain amount of overlap is essential. If the overlap is inadequate (less than 10 metres or 32 feet), there is a risk of connection being lost as a user passes from one coverage area to another.

As the user moves out of one coverage area, the handset needs time to scan and locate an alternative Base Station. If the alternative Base Station is not found in the time it takes to cross the overlap area, handover cannot take place and the system will disconnect the call.

The overlap calculation assumes a walking speed of 3.5 km/hour (or 2.2 miles/hour) and a scanning time of 10 seconds.

$$\text{Overlap} = \frac{\underline{3500 \text{ metres/hour (walking speed)}} \times 10 \text{ seconds (scanning time)}}{3600 \text{ (seconds/hour)}}$$

$$\text{Or} = \frac{\underline{2.2 \times 5280 \text{ feet/hour (walking speed)}} \times 10 \text{ seconds}}{3600 \text{ (seconds/hour)}}$$

MEASURING RADIO COVERAGE

In order to measure radio coverage, set the handset to 'RSSI Mode' and then return to the Main Menu by pressing the [<] key for a few seconds.

Table 1: Handset RSSI Mode

COMMAND	EXPLANATION
99981 ENTER	RPN XX YY where XX is the number of the locked Base Station. YY is the number of the alternative Base Station. [Not displayed on Deployments]. Q is the measure of the speech quality. RSSI AA BB where AA is the signal strength of Base Station XX above BB is the signal strength of Base Station YY above. [As for YY above]. **When performing the measurements, ensure that Q $\geq$ 52 and RSSI $\geq$ 40.**

PLACEMENT OF BASE STATIONS

When installing a system, the Base Stations must be positioned in such a way as to ensure that a certain amount of overlap exists. Refer to Figures 3 & 4.

Radio Coverage = Πr^2
(single Base Station)

r

Base Station

RPN - Base Station
Q52 - 52 to 64
RSSI - 30 to 64
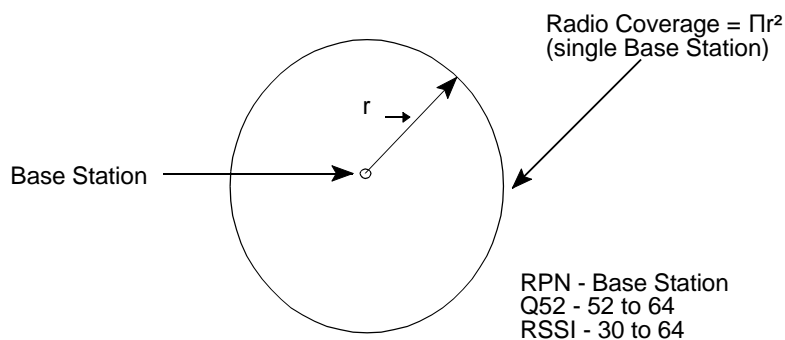
TAG11169-1

Figure 3: Radio Coverage for a Single Base Station

The extent of radio coverage within a building is determined by the buildings construction and materials and its surroundings.
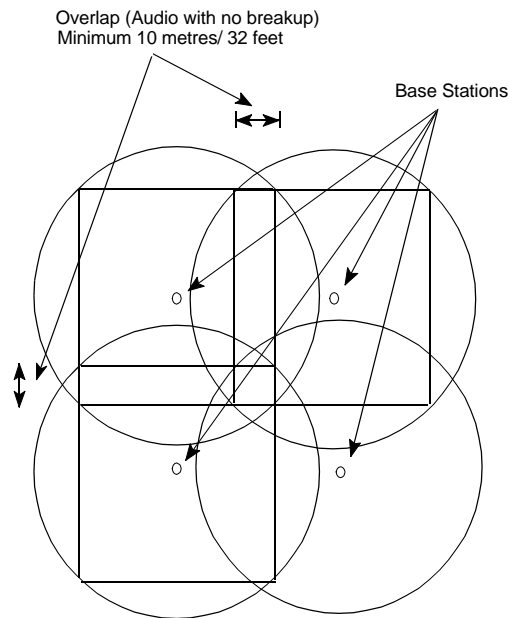
TAG11170-1

Figure 4:   Overlap between Several Base Stations

BASE STATION POSITIONING

The effects of overlap in determining the positioning of Base Stations for a multi-unit installation within a building is shown in Figure 5.
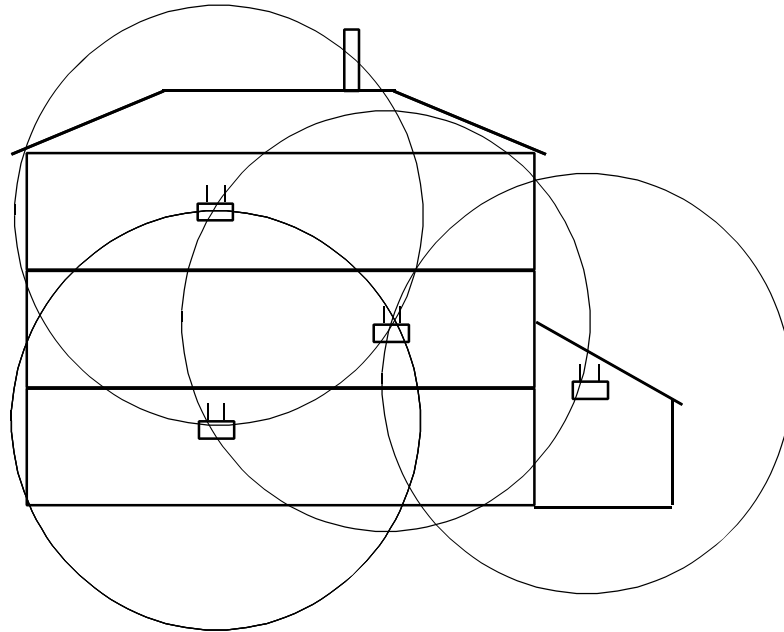
TAG11171-1

Figure 5: Base Station Positioning for Multi-Unit Installations

SECTION 6

CH 60 HANDSET OVERVIEW

CONTENTS:

PORTABLE PART (PP) (CH 60)
Overall Description
Menu System
List of CH 60 Handset Features

CH 60 HANDSET CHARGER OPERATING INSTRUCTIONS
Single Charger
Rack Charger
Fault Status

HANDSET FAULT FINDING
Unable to Register the Handset
Deployment Kit

PORTABLE PART (PP) (CH 60)

Overall Description

The CH 60 handset has the following feature keys (refer to Figure 1):

Call	The 'call' key is used when dialling one of the numbers stored in memory (0-9). These numbers can be memorised locally and as last number redial. When programming the memory keys the 'call' key is used to indicate a pause.
On-hook/Off-hook	The on-hook/off-hook key is placed on the side. This key is used when making or answering a call and when hanging up.
Menu	The 'menu' key toggles the menu display on and off.
Enter	When the 'enter' key is pressed, the item which is currently being displayed on the menu is accepted by the system. If the 'enter' key is pressed for 4 seconds, the handset will be switched off. If pressed again, the handset will be switched on.
Volume keys	(Volume Increase, Volume Decrease).
< and >	The handset has two arrow keys (< and >) for navigating through the menu options and scrolling text on the display. In editing mode, the < key also works as a backwards delete button.

The handset volume is controlled by two keys on the side of the unit.

A headset can be connected to the handset via a socket on the side of the unit.

The handset display comprises the following:

- A three-line alphanumeric dot matrix display: two lines each with 10 characters and one line with 12 characters.

- Four icons for general information, off-hook and menu facilities.

When on-hook is selected, the following is displayed:

Line 1: Text which must be programmed in the Controller (CCFP), maximum 10 characters. Default = DECT - CH 60

Line 2: Blank (or information from the Controller (CCFP) concerning calling line identification, message or text).

Line 3: Blank (ATT)
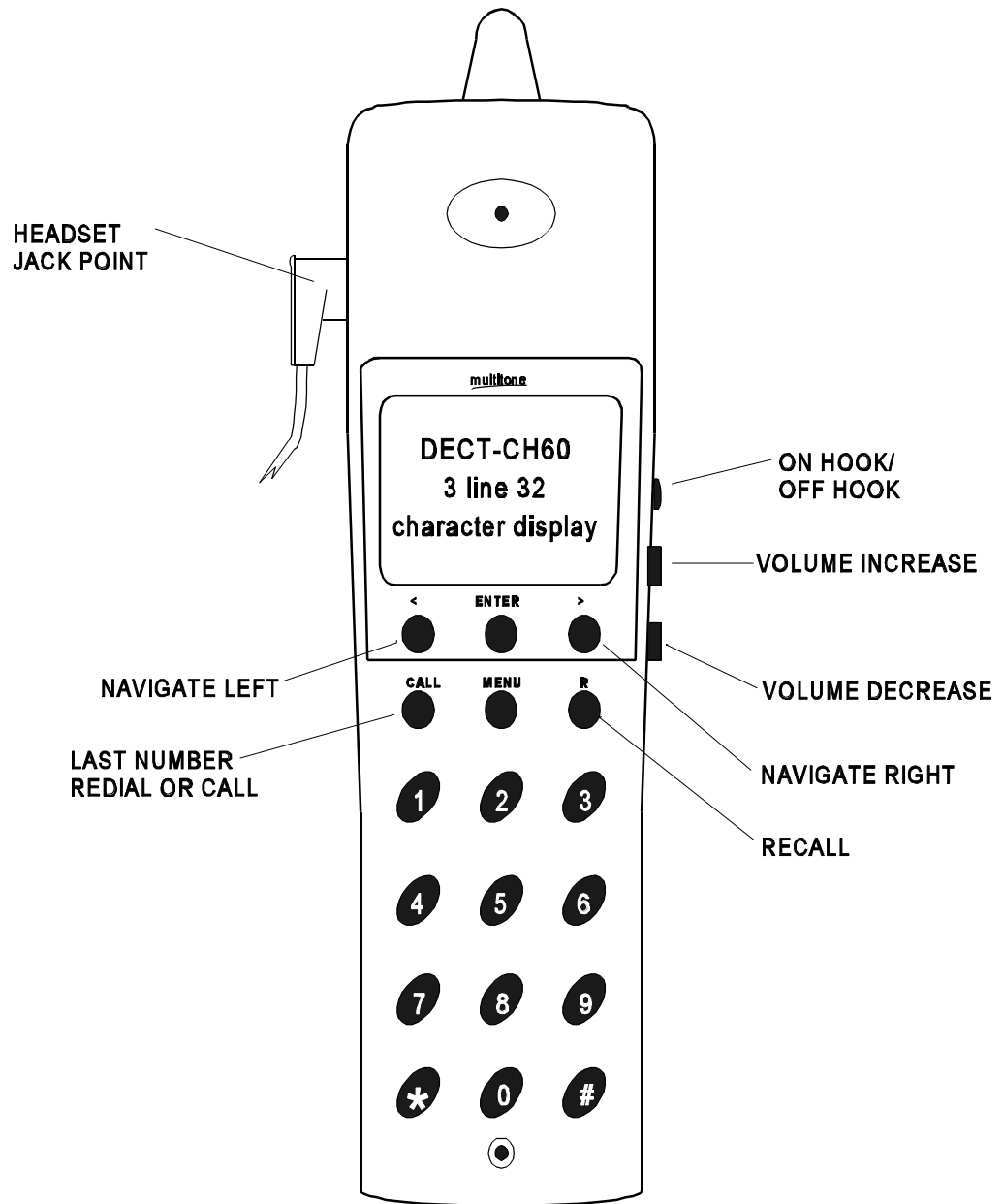
Figure 1: CH 60 Handset

Menu System

The menu mode is selected/de-selected by toggling the 'menu'. The menu sequence is shown in Figure 2.

The menu consists of a main menu and various submenus. The main menu comprises the following points:

- Set-up   The set-up function is used for choosing the ringing pattern, start volume, key click, subscribe and log-in parameters.
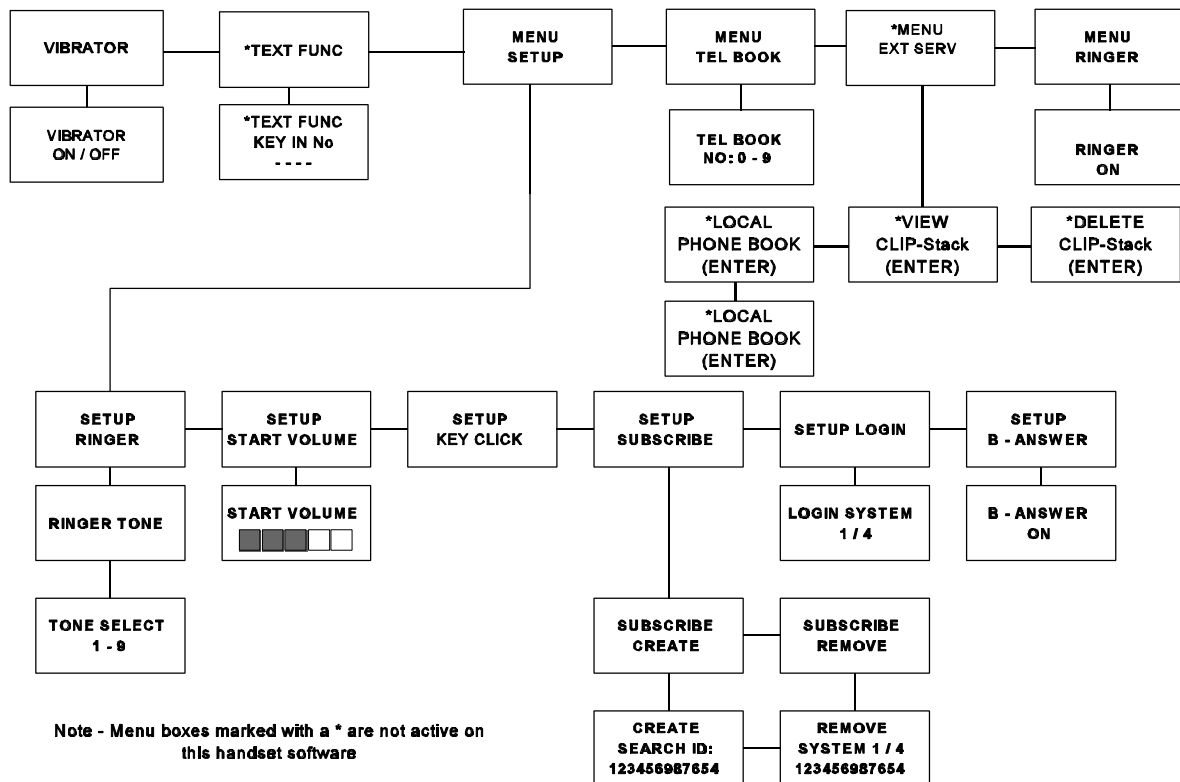
Figure 2: CH 60 Handset Menu Sequence

NOTE: *For details of the menus, refer to the Handset User Guide*

List of CH 60 Handset Features

The CH 60 handset exhibits the following features:

- CCITT keyboard lay-out.
- Keys for on/off-hook, menu and enter.
- Keys for scrolling of text in display and menu features.
- Key for Recall/Call Txfer.
- Key for mute feature [Enter key when off Hook].
- Dot matrix display with 4 icons, 2 x 10 characters and 1 x 12 characters.
- Connection for head set.
- Recall with 24 digits.
- 10 store telephone numbers (0-9).
- Programming pause and access code to public network.
- Regulation of the received volume.
- Tone ringer with 9 options.
- Customising set-up and keypad lock.
- Speech/stand-by time 10/90 hours.

Activation of the following B-answer feature (system features):

Receiving text messages via the Data Port on the CCFP.

Sending key pad signalling to the Data Port.

Pre-stored messages from the text bank in the CCFP to the Data Port or Handset. (To be implemented).

DTMF and pulse signalling via the CCFP.

CH 60 HANDSET CHARGER OPERATING INSTRUCTIONS

The CH 60 single and rack handset chargers, provide facilities to recharge the metal nickel hydride batteries. The single charger provides two slots for charging: one for the handset which is a slow charge, and one for a spare battery which is a fast charge. The rack charger provides a facility for up to four handsets on slow charge.

Single Charger

The single charger unit is designed for use on a flat surface only. The handset/battery should be fully plugged into the charger unit before the charger is connected to the mains supply.

The charging status is indicated by two dual state LEDs on the front of the charger. The left hand LED is for the CH 60 handset; the right hand LED is for the spare battery. The LEDs will show red when charging is taking place and green when fully charged.

A handset is charged slowly and will take up to eight hours for a handset with a totally discharged battery. As the charging process progresses the LED will turn from red to green. Once the handset is fully charged, the charge rate will automatically switch to trickle charge.

A spare battery is fast charged and will take up to 70 minutes for a fully discharged battery. The LED will turn green and the battery will be slow charged for two hours. The battery will then continue on trickle charge until used.

Rack Charger

The rack charger may be wall or desk mounted. Up to four rack chargers may be connected together using the connecting cable provided and powered from the same power supply. The handset/battery should be fully plugged into the charger unit before the charger is connected to the mains supply.

The 4-way rack charger has two separate LEDs to show the charge state. The right hand LED is red and indicates that charging is occurring. The left hand LED is green and indicates that the battery is fully charged. Slow charge will take up to eight hours for a totally discharged battery. Once the handset is fully charged, the charge rate will switch automatically to trickle charge.

Fault Status

If the battery temperature becomes excessive, the red LED will flash and charging will cease until the battery has cooled. If the red LED is lit steadily and the green LED flashes, the temperature may be too low. In this case the battery will trickle charge.

HANDSET FAULT FINDING

Unable to Register the Handset

If difficulty is experienced when trying to register the handset, the following aspects should be checked:

- Registration has been enabled. For a DOS program type `A1` to enable registration: for a windows program, enable the registration field in the appropriate window.

- Incorrect serial number has been entered.

- Authorisation code number is required.

- Login slot and subscribe are not matched.

NOTE: *Before commencing registration, it is recommend that the subscription slot is cleared. (This is achieved using the Subscribe Remove menu).*

Deployment Kit

Where difficulty is found when using the Deployment Kit to perform a registration, the following aspects should be checked:

- Registration button was not pressed for 5 seconds.

- Subscription slot is already in use.

INTENTIONALLY BLANK

SECTION 7

SOFTWARE USER GUIDE

CONTENTS:

PROGRAMMING SOFTWARE
Introduction

F_APP_DB.DAT PROGRAM
Editing the Datafile (DOS)
Editing Example
Converting the Datafile
Loading Data into the CCFP

CABLE DELAY MEASUREMENT

HANDSET SUBSCRIPTION

SIO.EXE PROGRAM
Booting-Up
Load Command
Loading New Flash System Software
Loading New Database Information
Cable (B) Command
Measure (M) Command
Insert (I) Command
Display (D) Command
Return (R) Command
Subscribe Command

STATUS MESSAGES

PROGRAMMING SOFTWARE

Introduction

The programming software is supplied on disk and is available in both DOS and Windows versions. The preferred method of installation is to create a directory on the host PC into which the contents of the disk should be copied. Communication with the CCFP is via the Data Port lead supplied. A flow diagram illustrating the programming operation within the installation sequence is shown in Figure 1.

```
        ┌──────────────┐                                      ┌──────────────┐
        │ INSTALL ALL  │                                      │ LOAD DATABASE│
        │ HARDWARE.    │                                      │ 1, 6-9, 19.  │
        └──────┬───────┘                                      └──────┬───────┘
               │                                                     │
        ┌──────▼───────┐                                      ┌──────▼───────┐
        │ INSTALL PC   │                                      │ SUBSCRIBE    │
        │ SOFTWARE.    │                                      │ HANDSETS -27.│
        └──────┬───────┘                                      └──────┬───────┘
               │                                                     │
        ┌──────▼───────┐                                      ┌──────▼───────┐
        │ CONNECT THE PC│                                     │ WINDOWS.     │
        │ TO THE CCFP.  │                                     └──────┬───────┘
        └──────┬───────┘                                             │
               │                                              ┌──────▼───────┐
   ┌───────────▼─────────────────┐                           │ ADD CCSMON3. │
   │ ENTER SIO.                  │                           └──────┬───────┘
   │ ENTER THE COMMAND INTERPRETER.│                                │
   │ SELECT THE REQUIRED OPTION FROM│                        ┌──────▼────────┐
   │ THE DISPLAYED LIST.         │                           │ AMMEND DOCUMENT.│
   └───────────┬─────────────────┘                           └───────────────┘
               │
        ┌──────▼───────┐
        │ CABLE        │
        │ MEASUREMENT - 10.│
        └──────┬───────┘
               │
        ┌──────▼───────┐
        │ FIRST TIME INSTALL.│
        │ LOAD FLASH 14-18.  │
        └──────┬───────┘
               │
               ▼
```
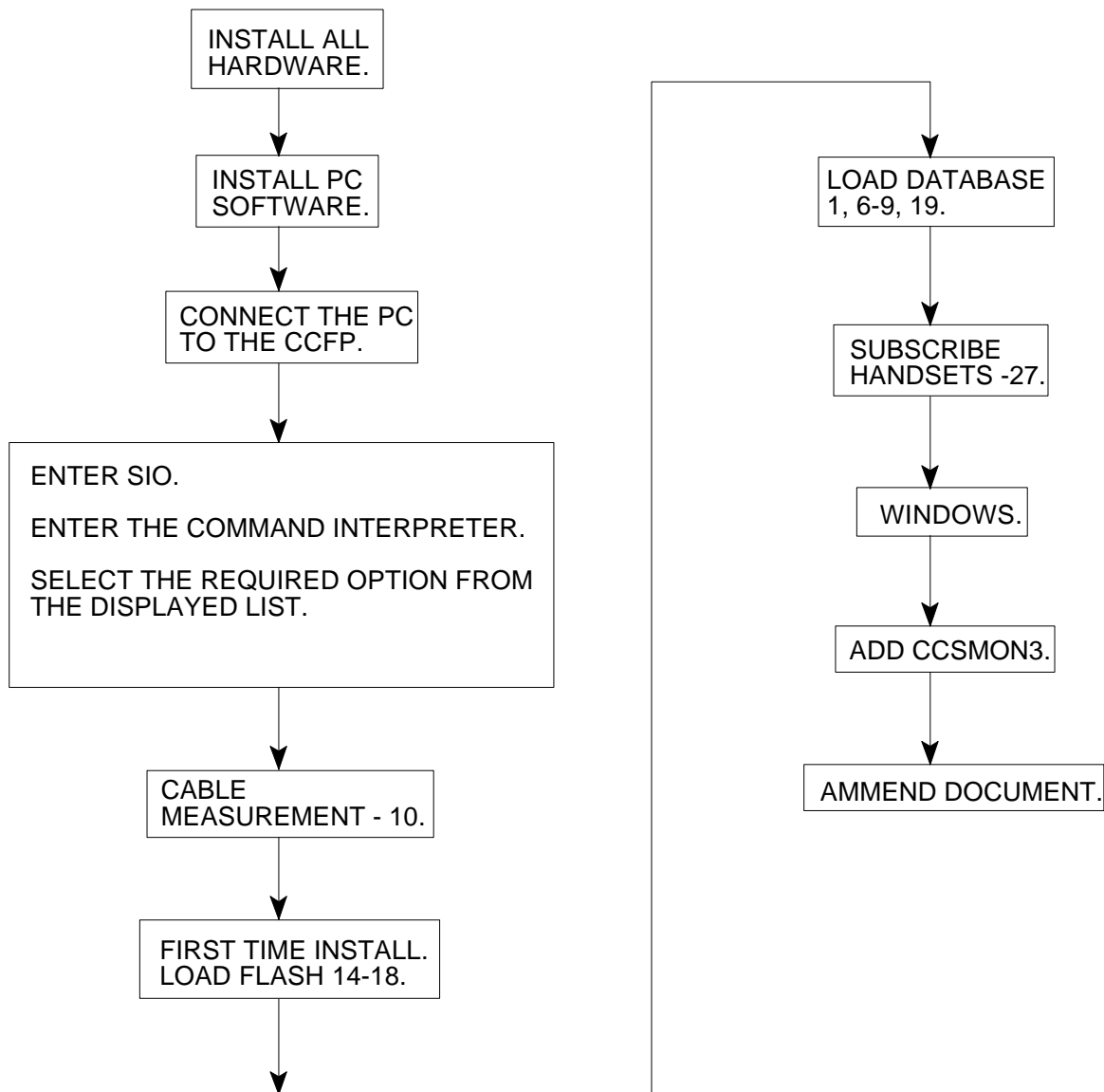
Figure 1: Installation Sequence

Programming is performed in three stages:

a)   Edit the datafile f_app_db.dat and create a user database.

b)   Save and convert the datafile using the appdbktb command.

c)   Load the converted file into the CCFP using the sio command.

> ***NOTES:***
>
> *1.   The default settings are normally used except for the following:*
>
> > *- RCMode (Recall Mode).   This must be set to Earth or Time Break according to the PABX system requirements.*
>
> *2.   The suppression should be turned off. This disables the Noise Suppression function in the handsets. The handset start volume must be set to low.*
>
> *3.   When using Windows version, the conversion process is automatic.*

F_APP_DB.DAT PROGRAM

Editing the Datafile (DOS)

The DECT files are stored in a directory designated at installation. For example, CS600.

Change directory to the CS600 directory in DOS mode. Type **Edit f_app_db.dat,** <CR>**.**

Create Users in accordance with the following notes:

NOTES:

> *1.   The format of the datafile must not be altered. When changing file data it is essential that each user record starts with a colon (:), each record item starts with a comma (,) and that each record ends with a comma (,).*
>
> *2.   Each user record must start with a colon (:) followed by the PABX code (e.g. 0).*
>
> *3.   A semi-colon (;) is used to indicate the end of the datafile.*

Editing Example

The following example of editing uses the file f_app_db.dat for the purposes of illustration.

```
/ Datafile for application database.
/ The file is converted to a binary file using the appdbktb program - ver. PCS 3.
/ Do not use colon or semicolon or comma in comments or names.
/ End of file is indicated by a semicolon.
/
/ First record must contain Exch code - max 4 digits.
/
/ Second record must contain the Ringing Mode.
/ 0 = System generated ringing * 1 = Exchange ringing.
/
/ For each IWU card the following data must be included - 8 records.
/ IWU - The IWU-card for which the data is related.
/ RingFreq - Ringing frequency.


/   0 = 13 - 60Hz * 1 = 20 - 60Hz * 2 = 20 - 30Hz.
/ RCMode - Recall mode.
/   0 = Earthing * 1 = Loop break.
/ RCTimg - Recall timing (Loop break / earth pulse in ms).
/   0 = 100 / 400 * 1 = 290 / 400 * 2 = 630 / 400 * 3 = 100 / 2500 * 4 = 290 /  2500
* 5 = 630 / 2500.
/ DialMode - Dial mode.
/   0 = Pulse * 1 = DTMF.
/ DTMFTimg - DTMF timing (in ms).
/   0 = 80 * 1 = 90 * 2 = 100.
/ PulsTimg - Pulse timing (Pulse / pause in ms).
/   0 = 40 / 60 * 1 = 34 / 66.
/ PauseTime  - Pause time.
/   0 = 3 s * 1 = 4 s * 2 = 6 s * 3 = 8 s.
/ DTFilter - Dial tone filter.
/   0 = 384 - 467Hz * 1 = 343 - 507Hz * 2 = 303 - 549Hz * 3 = 262 - 630Hz.
/ Suppressor - Suppressor.
/   0 = On * 1 = Off.
/
/ For each user the following data must be included - up to 64 records.
/ IWU - The number of the IWU-card.
/ CH - The channel on the IWU-card.
/ IPEI - The unique serial number for the handset.
/ AC - The Authentication Code.
/ Name            - The users name - max 10 characters.
/ LocalNo - The local number of the user - max 12 digits.
/ StbTxt - The Standby text showed in the display of the handset - max 10 characters.
/ PresTxt - The Presentation text send towards calling user - max 32  characters.
/
/
/ An empty record is indicated by a colon followed by a -.
/ If an user is removed the position must contain an empty record.
/ Do not just delete a line in the file.
/
/ NOTE - Do not move the user in the file to change IWU and/or Channel.
/        Replace IWU and/or Channel in the line attached to the user.
/
/ Exchange code - Normal digit dialled for an outside line
:0, /Exchange Code (Country sensitive)
/
/ Ringing Mode - 0 = System generated, 1 = Host PABX
:1,
/
/IWU data - See parameter description above. Order of cards must be followed.
```

```
/IWU  RingFreq  RCMode  RCTimg  DialMode  DTMFTimg  PulsTimg  PauseTime  DTFilter  Suppressor
/---------------------------------------------------------------------------------------------
:0,   1,          1,                0,                                             1,1,0,0,
2,    0,
:1,   1,          1,                0,                                             1,1,0,0
2,    0,
:2,   1,          1                 0,                                             1,1,0,0,
2,    0,
:3,   1,          1,                0,                                             1,1,0,0,
2,    0,
:4,   1,          1,                0,                                             1,1,0,0,
2,    0,
:5,   1           1,                0,                                             1,1,0,0,
2,    0,
:6,   1,          1,                0,                                             1,1,0,0,
2,    0,
:7,   1,          1,                0,                                             1,1,0,0,
2,    0,
/

/User data - See parameter description above. Include valid records only.


/IWU   CH    IPEI(EMC PSN C)            AC                                          NAME
                                                                                   LocalNo
                                                                                   StbTxt
                                                                                   PresTxt

/-----------------------------------------------------------------------------------------
:0,    0,            00077 0004312 *,      180449,                                  PSG,
410,   DWS - 219,    ,
:0,    1,            00077 0005213 *,      ,                                        MKT,
460,   JC - 220,     ,
:0,    2,            *,                                                             ,,,,,
:0,    3,            *,                                                             ,
,      ,             ,                                                              ,
:0,    4,            *,                                                             ,
,      ,             ,                                                              ,
:0,    5,            *,                                                             ,
,      ,             ,                                                              ,
:0,    6             *,                                                             ,
,      ,             ,                                                              ,
:0,    7,            *,                                                             ,
,      ,             ,                                                              ,
; / end of data file


Create Users

Setup IWU boards
```

To save the file, press the ALT key and, whilst continuing to hold it down, press F then S.

To exit the appdbktb.exe program press the ALT key and, whilst continuing to hold it down, press F then X.

Converting the Datafile

The datafile, f_app_db.dat, has to be converted to a binary format before it can be transferred to the CCFP. Data conversion is performed using the appdbktb.exe [type: `appdbktb`]. The converted datafile is named f_app_db.ktb.

If the file has been correctly compiled, this program will covert the data automatically and display 'Conversion Completed'. If there are any errors, these will be displayed and it will be necessary to go back to the f_app_db.dat file and re-enter parameters.

Loading Data into the CCFP

CAUTION

THE SYSTEM WILL BE DOWN DURING THIS PROCESS. NO NEW CALLS MAY BE MADE. ANY EXISTING CALLS WILL BE LOST.

Once the file has been converted successfully, the sio program should be selected. Refer to paragraph 12. Type `sio`. When the menu is displayed, type `LN`, <CR>. When prompted for the password type `0000`, <CR>. When asked for a filename, type `f_app_db.ktb`, <CR>. The program will commence downloading. When complete, the message 'DBG TXT from RPN: 0' will be displayed. This message will be repeated for each Base Station on the system, with the final digit increasing up to the system Base Station loading.

CABLE DELAY MEASUREMENT

When installing the system, it is essential that the cable delay is set for each Base Station. To measure the cable delay, proceed as follows:

From the sio program:

a)   Type `B,`<CR> to call up the Cable Menu.

b)   Measure the cable delays by typing `M`, <CR> then entering `0000`, <CR> at the password prompt. This will clear the current delays and display the cable menu.

c)   The program will automatically measure the delay for each Base Station, in turn. As each measurement is completed, 'dbg.txt' is displayed against the corresponding Base Station.

d)   When the delays for all Base Stations have been measured, type `D,` <CR> to display the values and confirm that the delays have been measured correctly.

e)   Type `R`, <CR> to return to the main menu.

HANDSET SUBSCRIPTION - DOS Interpreter

The following instructions refer to version 1.0 of the CCFP software. It is necessary to subscribe each handset onto the system. The supplied handsets have already been subscribed. If however it is necessary to subscribe a further handset to the system, follow the procedure below.

From the sio program (Version 1.0) menu:

a)   Enter subscribe enable by typing `A1, <CR>`.

b)   Refer to the User Guide for details on subscribing to the handset.

c)   Enter subscribe disable by typing `A0, <CR>`.

SIO.EXE PROGRAM

Booting-Up

CAUTION

THIS COMMAND WILL HALT THE SYSTEM.

When booting-up the system, the following menu is displayed on screen:

```
+******************************** COMMAND INTERPRETER ************************************    +
|Flash program part number 13300100. Flash program Edition 3.                                |
+ Command ---              + Syntax ---------------  + Description---------------------------------------------------------  +
| Display                  | D                       | Display FLASHCODESTATUS                                                |
| Load  | L F|N|B          | Load into Flash/Non-Volatile Memory/Base Stations                                             |
| Time + Date              | T [MM:DD:hh:mm]         | See /set date and time                                                 |
| Start  | S               | Run Program in Flash    |                                                                      |
| Connect                  | C                       | Set up Switch in Connect Mode                                          |
| Message                  | M                       | Set up Switch in Message Mode                                          |
| IWU                      | I 0|..|7                | Set Up to IWU                                                          |
| Log                      | G                       | Log Handling                                                          |
| Heap                     | H                       | Show Heap Status                                                      |
| Clear                    | E                       | Erases EEPROM Data                                                    |
| Cable                    | B                       | Cable Menu                                                            |
| Subscribe                | A 0/1                   | Disable/Enable Subscription                                           |
| EEPROM                   | P A & S                 | Read block in EEPROM A=ADDR S=SIZE                                    |
| Debug                    | N                       | Enter debug mode                                                      |
| Resume                   | [Esc] + R               | Resume Boot Program                                                   |
| Quit                     | [Alt] + Q               | Quit Program                                                          |
+----------------         -+---------------------- ---  +------------------------------------------------------- ---------------  +
```

NOTE: *Some of the above commands are for development debugging only.*

Load Command

The load command is used to load new software and data into the system.

Syntax: L F.   This command is used for loading new Flash system software into the CCFP (items 14 to 16).

Syntax: L N.   This command is used for loading new data from the user database into the CCFP (items 17 and 18).

Loading New Flash System Software

Enter the L F followed by <CR>. When prompted, enter the password. The default password is 0000.

The new software will be loaded into the system from the file flash.ktb. The file must be located in the same directory as the SIO.exe program. On completion of loading, the system will start automatically with the new software.

If, for some reason, the load procedure stops before completion, the load procedure will have to be repeated. It will be necessary to switch off the power and then power-up the system again. In this case a different menu will appear on the screen. A link is located at the front of the control unit motherboard. This link should be inserted in the motherboard when upgrading the system or if the Eprom becomes corrupted when loading the flash system software.

```
+********************* COMMAND INTERPRETER *****************************        +
| Flash program part number 13300100. Flash program Edition 3.                 |
+ Command ------        -+ Syntax --------      + Description------------------------------------        +
| Load                  | LOAD F|N             | Load into Flash/Non-Volatile Memory                    |
| Read N                | READ N               | Read Non-Volatile Memory                               |
| Restart               | RESTART              | Restart System                                         |
| Mem                   | MEM                  | Memory Read/Write                                      |
+----------------------        +------------------        +------------------------------------------------------        +
```

Syntax: Load F, one space between Load and F.

Note: *When using previous menu, 'L' only is required. In this menu, however, 'Load' is required.*

Enter Load F followed by <CR>. When prompted, enter the password. The default password is 0000.

The new software will be loaded into the system from the file flash.ktb. The file must be located in the same directory as the SIO.exe program. On completion of loading, the system will start automatically with the new software. This process will take approximately 5 minutes.

Loading New Database Information

Enter L N followed by <CR>. When prompted, enter the password (default 0000) followed by <CR>. When prompted with a Filename to load [Filename = f_app_db.ktb], enter the filename followed by <CR>. The data will be loaded. On completion of loading, the system will start automatically.

Cable (B) Command

The Cable command is used for entering the cable menu.

Syntax: B <CR>. This command is used to display the cable menu on screen as follows:

```
+************************************* CABLE MENU *****************************************+
| This is the submenu for cable delay                                                    |
+ Command ---+ Syntax ------------------+ Description-------------------------------------+
| Measure                | M                     | CCFP enters cable delay measurement mode         |
| Insert                 | I[RPN NO] [DELAY]     | Insert Cable Delay (Tick * 80(ns))               |
| Display                | D                     | Display Cable Delay                              |
| Return                 | R                     | Return to Main Menu                             |
+-------------------+-----------------------------+----------------------------------------------------------------+
```

In the cable menu you can perform automatic cable delay measurement (M), insert delay manually (I) and display the actual delays (D). The R command returns to the main menu.

Measure (M) Command

CAUTION

THIS COMMAND WILL HALT THE SYSTEM.

The Measure command measures cable delays and, afterwards, downloads the measured values to the Base Stations.

```
Syntax: M <CR>
```

Enter letter M followed by <CR>. When prompted, enter the password [0000] followed by <CR>. The cable delay measurement will start automatically. After the password has been entered, the menu will again be displayed, the first RPN will come up and measurement will commence. When the measurements and delay download are complete, the system will start-up automatically with the new delays. The system will remain in Cable menu until 'R' is selected to resume the Main menu.

Insert (I) Command

The insert command can be used if, for some reason, it is necessary to manually insert a cable delay to a Base Station.

Syntax: I[Base Station number] [delay] <CR>. The delay is tick * 80ns decimal,
     e.g. I0 3 = Base Station 0 has a delay 3 * 80ns.

The delay will be activated next time the system is started-up.

Display (D) Command

The display command is used for displaying the actual delays.

Syntax: D <CR>

Enter D followed by <CR>. The system will display the delays for Base Stations 0 to 15.

```
RFP # 0:  8 x 80ns
RFP # 1: 12 x 80ns
RFP # 2: 16 x 80ns
            .
            .
            .
RFP # 15: 2 x 80ns
```

Return (R) Command

The return command will return the program to the main menu.

```
+*********************************** COMMAND INTERPRETER *************************************+
| Flash program part number 13300100. Flash program Edition 3                                |
+ Command -------+ Syntax -------------------+ Description-----------------------------------+
| Display             | D                        | Display FLASHCODESTATUS                   |
| Load  | L|F|N       | Load into Flash Memory/Nv Mem                                        |
| Time/Date           | T MM:DD:hh:mm            | Set Time/Date                            |
| Start  | S          | Run Program in Flash     |                                          |
| Connect             | C                        |Set up Switch in Connect Mode             |
| Message             | M                        | Set up Switch in Message Mode            |
| IWU                 | I 0|..|7                 | Set Up to IWU                            |
| Log                 | G                        | Log Handling                             |
| Heap                | H                        | Show Heap Status                         |
| Clear               | E                        | Erases EEPROM Data                       |
| Cable               | B                        | Cable Menu                               |
| Subscribe           | A 0/1                    | Disable/Enable Subscription              |
| EEPROM              | P A & S                  | Read block in EEPROM A=ADDR S=SIZE (Decimal) |
| Debug               | N                        | Enter debug mode                         |
| Resume              |[Esc] + R                 | Resume to Boot Program                   |
| Quit                | [Alt] + Q               | Quit Boot Program                        |
+-------------------+---------------------------+------------------------------------------+
```

Subscribe Command

The subscribe command is used for allowing subscription to the system.

Syntax: A0..1 <CR>. A0 disables subscription and A1 enables subscription

Subscription is limited to those handsets which are registered in the database.

STATUS MESSAGES

The handset connection handover status messages and their corresponding explanations are detailed in Table 1.

Table 1: Handset Connection Handover (CHO) Information

Lc enters ho pending state HS: 0. CHO from RPN: 3 to RPN: 2	Handset No. 0 has made CHO from Base Station 3 to 2
Handset off hook information HS: 7 connected on RPN: 2	Handset No. 7 off hook connected to Base Station 2
Base Station start-up information RPN: 1 is up. CDV: 162 (Dec.) is downloaded to RPN: 1	Base Station in communication Cable delay downloaded to base station

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