



PREDATOR BASE STATION AND REPEATER



OVERVIEW

The IRC Predator range of security and telemetry products have a number of options for getting messages from outstations to the control room monitoring software

The network components are

1. Base Station
2. Repeater
3. Fill-in Parrot

The Base Station and Repeater are the the same unit (the IRC DATA ROUTER). It is programmed to work as a base or repeater using the programming software.

The Fill-in Parrot is a smaller, cheaper, unit mounted in an outstation housing.

A programmer and diagnostic software tool called HIGHSITE.EXE is available for setting up and testing of the network components.

The program is available on the IRC CD or on our website www.ircradio.co.za

Each piece of equipment on the network has a unique address assigned to it by the programmer.

Planning is the most important aspect when setting up a network.

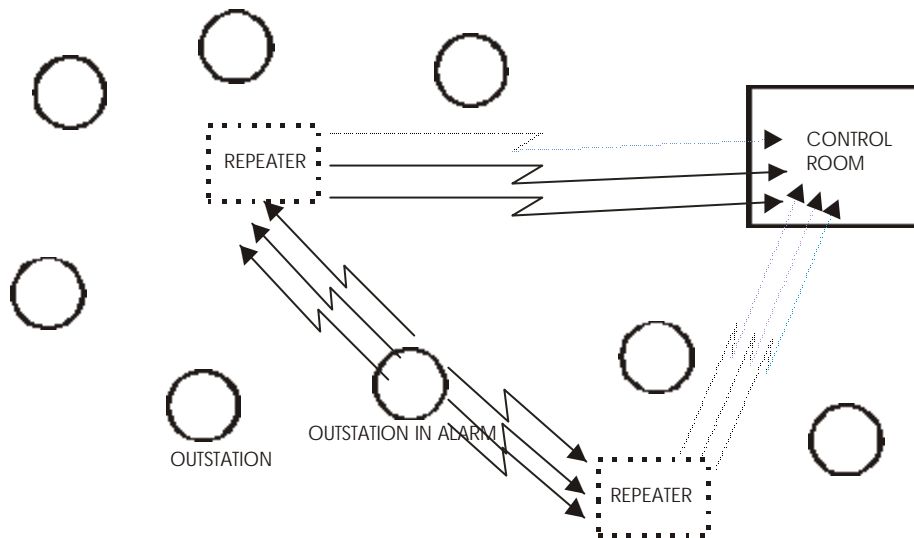
Base Station

The Base Station receives alarms directly from outstations or via repeaters. The base station is programmed to respond to only certain groups of outstations thus allowing more than one control room to be placed on the same network.

Base stations always have the address '000' on the network. The address '000' is entered via the keypad and then the base station is programmed to respond to a given group/groups of outstations via the Highsite Programming software.

Repeaters

The repeater is normally the only means used by the security industry to get a signal from an outstation which is beyond direct communications range through to a base station.



REPEATERS IN A PREDATOR NETWORK

The repeaters are spread around the required area of coverage on suitable sites and repeat the signal from the outstation as they receive it.

Repeaters can be programmed to accept signals from other repeaters so that distant outstations can be received at the base.

The repeaters change the header of the received signal when repeating it in order to identify the repeater to other repeaters and the base station

Up to seven repeaters can be placed on a network. They are numbered 001 to 007 on the network.

Repeaters can be programmed to repeat the signal from another repeater, thereby increasing the range from the outstation to the control room.

Fill-in Parrot

The fill-in parrot is used to get signals from 'difficult to get to' outstations. Fill-in parrots will repeat the signal from outstations but not from each other or repeaters.

The fill-in parrot is not intended to be mounted in a highsite environment which contains other equipment with radio transmitters.

Fill-in parrots are numbered 008 on the network.

PLANNING THE NETWORK

Planning is the most important aspect of setting up the network.

The Base Station will obviously be placed at the control room where it is connected to the monitoring software.

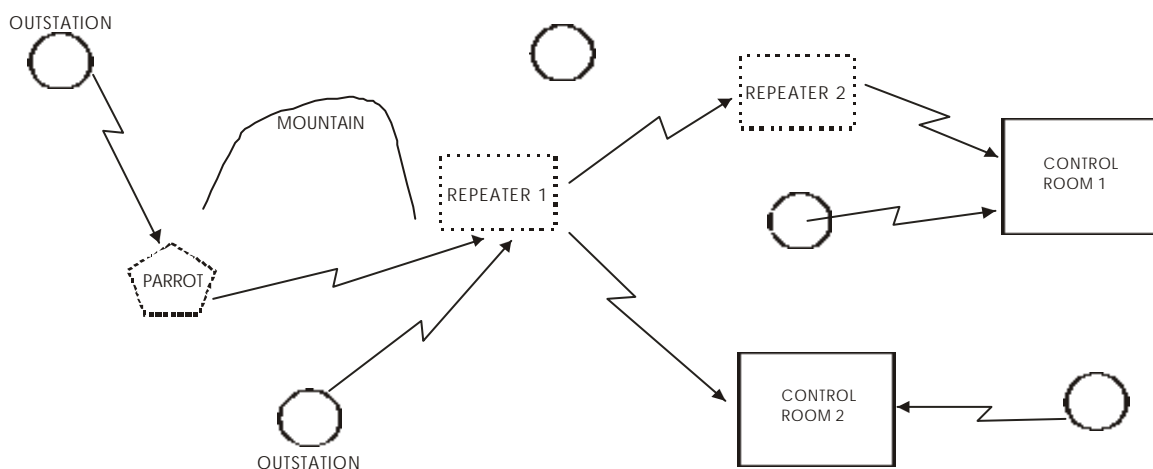
Repeaters will be spread around the area in such a way as to maximise the coverage of the outstations which will be monitored. Repeaters are normally placed in suitable high locations (highsites) to maximise coverage.

Each repeater must have good communications to the Base Station.

Repeaters located at highsites should be installed by a person with radio frequency knowledge. Interference by other equipment located at the highsite should be monitored to make sure that it is not affecting the reception of alarms.

Fill-in Parrots are designed to get signals from difficult-to-reach outstations, eg. from behind a mountain. They can be mounted in existing alarm installations, domestic or industrial, but are not suitable for use on highsites where other radio equipment is mounted.

If more than one customer is to be put on the network, the repeaters and base stations must be limited in the number of outstations that they respond to so that one control room does not receive alarms from outstations belonging to another customer.



EXAMPLE OF A PREDATOR NETWORK

An example of a network is shown above. The network and frequency are shared between two different control rooms.

The parrot has been installed because some of the outstations cannot communicate to a repeater as there is a mountain in the way.

Repeater number 1 is repeating alarms to both control rooms. Repeater number 2 is repeating messages intended only for Control Room number 1.

Repeater number 2 has been programmed to forward alarms from Repeater number 1.

Repeater number 1 has been programmed to forward alarms from the Fill-in Parrot.

The Base Stations in the control rooms have been programmed to respond to different groups of outstations.

The steps to be followed when putting up a network are :

1. Decide which area you wish to cover with outstations
2. Decide where your Base Station is to be located
3. Decide where you are going to need Repeaters
4. Make sure that your licencing with the regulating authority is in order and that it states
 - ❖ The type of equipment to be used (IRC Predator)
 - ❖ The area of coverage of outstations
 - ❖ The location of the Base station(s) and Repeater(s)
5. Order the equipment you need, programmed to your frequency
6. Program your base station and repeaters to respond to your outstations,
7. Program your repeaters with the number of the repeaters to forward messages from (if necessary).
8. Install your base station using a good antenna (end-fed or dipole) and good coaxial cable. RG58 is not suitable for long runs and outdoor installations. Rather use RG219.
9. Install the antenna as high as possible.
10. Install your repeaters using good cable and antennas. Monitor for interference from other equipment on the highsite.
11. Get a professional to do the installation if necessary
12. Test the operation of the network by transmitting alarms within your coverage area and make sure that they are received on the Base Station.

INSTALLATION AND PROGRAMMING

Base Station

The base station receives the alarms from the repeaters or outstations and forwards them to the monitoring software running on the PC.

Overview

The IRC Base Station has the following features :

1. Reception of alarms from transmitters and full bi-directional communications with transceivers.
2. Reception of standard dry contact alarms or full Contact ID alarms.
3. LCD display and keypad for diagnostics purposes.
4. Two RS232 ports, one for connection to the PC based monitoring software and a spare which can be connected to a serial printer.
5. Selective selection of groups of outstations which can be received allowing for multiple base stations to be installed on the same network.
6. Configurable as a repeater allowing for only one type of spare unit to be kept in stock.
7. Selection of communication formats to the monitoring software, IRC or industry standard Surgard.
8. Stacking of incoming alarms for more secure operation in cases where the monitoring software should malfunction.

Installation

The base station requires the following connections

1. 220V AC power via the 'kettle lead' connector at the rear of the unit. The base station has its own internal battery and charger which should provide approximately 1 day of operation without power.
2. An antenna connection. A PL259 (UHF type) connector is provided at the rear of the unit.
3. An RS232 connector to the PC running the monitoring software. The PC is plugged into the top RS232 port (marked computer).
4. A second RS232 port is available for connection to a serial printer.

Antenna Installation

The antenna installation should be done by qualified personnel. A good quality external dipole or end-fed type antenna should be used. End-fed antennas are more suitable for mounting in coastal areas as they are normally fibre glass and not metal.

The antenna should be mounted externally, as high as possible, using good quality coaxial cable (eg. RG219). Standard RG58 cable is not suitable for long antenna runs.

Because the IRC Base Station includes a transmitter for use with bidirectional outstations, the antenna should be properly matched. A through-line wattmeter should be used to confirm antenna matching.

RS232 port installation

The top RS232 port is plugged into the computer using the serial cable supplied with the unit.

Turn the base station on and view the LCD on the front of the unit. When the Base Station starts it will display :

IRC BASE 000
SOFTWARE VERSION X.X

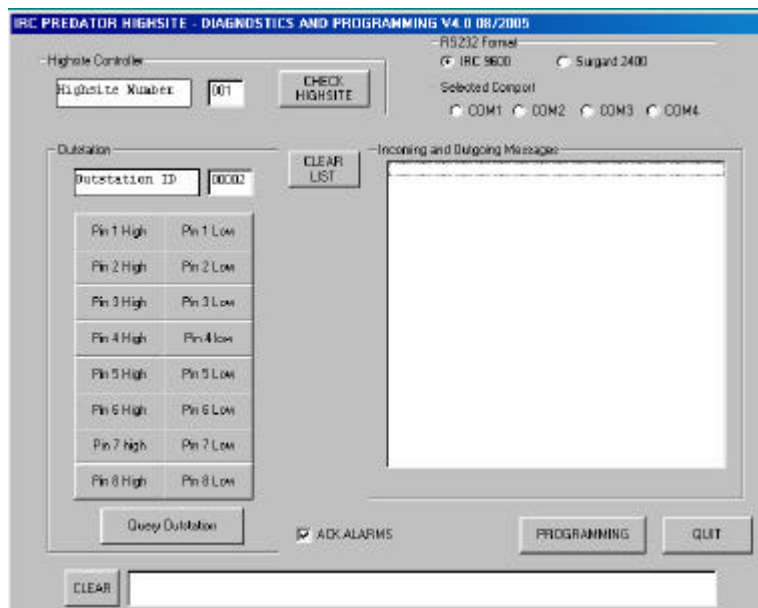
Indicating that the unit is programmed as a base station and showing the software version. If the unit does not indicate that it is a base station, refer to the programming section below.

The base station is tested and programmed using the HIGHSITE.EXE software installed from the IRC CD or obtained from our website www.ircradio.co.za

If you install the IRC CD, a shortcut will be placed on your desktop. Alternatively, the program can be run from the Start menu

Programs – Irc Software – Predator (security) – Highsite Programmer

With the RS232 cable connected, run the HIGHSITE program on the PC.



HIGHSITE DIAGNOSTICS SCREEN

Select the correct Com Port on the Highsite program.

In the HIGHSITE NUMBER box, enter 000 (the number of the base station)

Click on the CHECK HIGHSITE button. The incoming and outgoing message screen will display :

HIGHSITE STATUS CHECK
HIGHSITE REPLY 000

If the reply message is not received, the com port connection should be checked. Make sure that there are no conflicting devices such as a mouse or the monitoring software.

Programming the Data Router to a Base Station

Turn the power switch on at the back of the Data Router and monitor the LCD on the front of the unit. The LCD will display

IRC BASE 000
S/W Version X.X

If the unit has not been configured as a base station then do the following.

1. Wait for the unit to finish initialising
2. The LCD will now display the main menu

UNIT :
ENTER OUTSTATION OR ↑↓

3. Hold down the CLR key and the (E) key simultaneously for five seconds.
4. The LCD will display

UNIT NUMBER XXX
ENTER TO CHANGE, CLR TO ACCEPT

5. Press the ENTER key
6. Enter the number 000 (base station)

Programming the Base Station RS232 format

After the data Router has been programmed as a Base Station, the format that is communicates with the monitoring software can be changed.

Two formats are available

IRC	Proprietary IRC protocol. Includes separate messages for dry contact (connection to outstation terminals) and full Ademco Contact ID reporting. The IRC protocol also supports bidirectional (commands and queries) the IRC transceivers.
SURGARD	The industry standard telephone monitoring standard. Surgard supports full contact ID.

Programming the Base Station

The Base Station programming is done via PC using the standard serial cable supplied. Refer to *RS232 port installation* above.

- ❖ Run the HIGHSITE program.
- ❖ Select the correct COM port
- ❖ Click on the *PROGRAMMING* button. The programming screen will be displayed.
- ❖ Make sure that the *Base Number* is set to '0' and that the type of unit selected is *BASE STATION*

The groups of outstations that the Base Station will respond to can now be changed. The default is **all outstations** .

Up to 50 groups of outstations can be entered in the list. The 'X' character is used as a 'wild-card'

For example

XXXXX	Respond to all outstations (00001 to 99999)
0XXXX	Respond to all outstations starting with a zero (00001 to 09999)
00XXX	Respond to all outstations starting with 00 (00001 to 00999)
01XXX	Respond to all outstations starting with 01 (01000 to 01999)

Limiting the groups of outstations in a base allows more than one base station to be put on a network.

To delete a group

- ❖ Click on the group (highlighted blue)
- ❖ Click on *Delete Outstation(s)*

To add a group

- ❖ Enter the 5 digit group, using 'X' (uppercase)
- ❖ Click on *Add Outstation(s)*. The new group will now be displayed in the list.

To download the programming data

- ❖ Make sure the Base Station is connected to the computer.
- ❖ Click on the *Program Highsite* button.

The programming information will be downloaded into the Base Station. The Base Station will then re-initialise and resume operation with the new settings.

If the message *NO RESPONSE FROM HIGHSITE* is received, check the RS232 port connection.

Repeater

The Repeater receives the alarms from the outstations and forwards them to the Base Station.

Overview

The IRC Repeater has the following features :

1. Reception of alarms from transmitters and forwarding to the Base Station(s).
2. Reception of standard dry contact alarms or full Contact ID alarms.
3. Forwarding of Commands and Queries to bi-directional outstations.
4. LCD display and keypad for diagnostics purposes.
5. RS232 ports for programming and expansion.
6. Selective selection of groups of outstations which can be received allowing for multiple Repeaters to be installed on the same network.
7. Forwarding of alarms from other Repeaters (diassy-chaining) allowing far-off outstations to be covered.
8. Configurable as a Base Station allowing for only one type of spare unit to be kept in stock.

Installation

The repeater requires the following connections

1. 220V AC power via the 'kettle lead' connector at the rear of the unit. The base station has its own internal battery and charger which should provide approximately 1 day of operation without power.

OR

2. 12V External DC (nominal 13,8V) 6A connected via the two terminals at the back. Red Positive, Black Negative

Mains and external DC can be connected simultaneously. The Repeater will automatically switch to the internal supply should the external one fail.

If only the external DC supply is used (no 220V AC), the internal battery in the Repeater should be removed.

3. An antenna connection. A PL259 (UHF type) connector is provided at the rear of the unit.

Antenna Installation

The antenna installation should be done by qualified personnel. A good quality external dipole or end fed type antenna should be used. It should be mounted externally, as high as possible, using good quality coaxial cable (eg. RG219). Standard RG58 cable is not suitable for long antenna runs.

Because the IRC Base Station includes a transmitter for use with bidirectional outstations, the antenna should be properly matched. A through-line wattmeter should be used to confirm antenna matching.

Note that special precautions for Repeaters mounted on highsites alongside other equipment should be taken.

Other transmitters operating on the highsite may interfere with the receiver on the Repeater, thus degrading its range performance or even totally blocking signals from outstations from being received.

Specialised highsite equipment such as helical filters or cavity filters may be required for the installation. Consult a highsite specialist for assistance.

Programming the Repeater

Programming the Data Router to make a Repeater

Turn the power switch on at the back of the Data Router and monitor the LCD on the front of the unit. The LCD will display

IRC REPEATER 001
S/W Version X.X

If the unit has not been configured as a Repeater then do the following.

1. Wait for the unit to finish initialising
2. The LCD will now display the main menu

UNIT :
ENTER OUTSTATION OR ↑↓

3. Hold down the CLR key and the (E) key simultaneously for five seconds.
4. The LCD will display

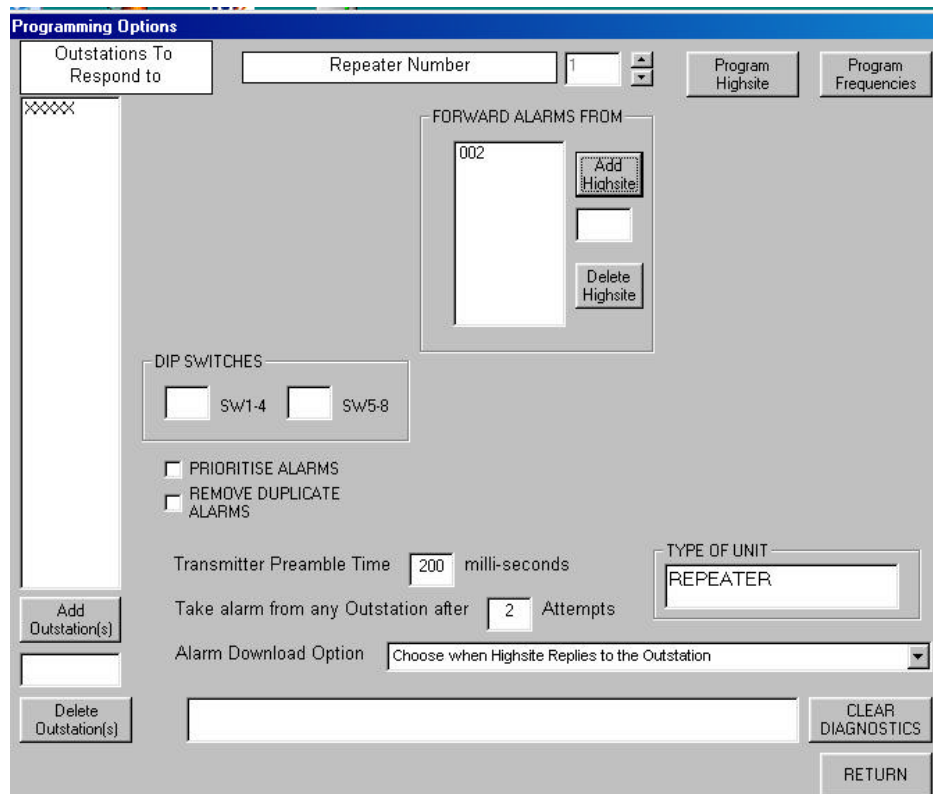
UNIT NUMBER XXX
ENTER TO CHANGE, CLR TO ACCEPT

5. Press the ENTER key
6. Enter the number 001 to 007 depending on which Repeater is required.
7. Set the RS232 format to IRC.

Programming the Repeater

The Repeater programming is done via PC using the standard serial cable supplied. Refer to *RS232 port installation* above.

- ❖ Run the HIGHSITE program.
- ❖ Select the correct COM port
- ❖ Click on the *PROGRAMMING* button. The programming screen will be displayed.
- ❖ Make sure that the Repeater *Number* is set to correspond to the repeater number entered using the keypad, and that the type of unit selected is *REPEATER*



REPEATER PROGRAMING SCREEN

There are two parameters to enter for the repeater

1. The groups of outstations that the Repeater will forward alarms from
2. The other Repeaters that this Repeater will forward alarms from.

Changing Groups of Outstations

The groups of outstations that the Repeater will respond to can be changed. The default is **all outstations**.

Up to 50 groups of outstations can be entered in the list. The 'X' character is used as a 'wild-card'

For example

XXXXX	Respond to all outstations (00001 to 99999)
0XXXX	Respond to all outstations starting with a zero (00001 to 09999)
00XXX	Respond to all outstations starting with 00 (00001 to 00999)
01XXX	Respond to all outstations starting with 01 (01000 to 01999)

Limiting the groups of outstations in a Repeater allows more than one Repeater of the same number to be put on a frequency.

To delete a group

- ❖ Click on the group (highlighted blue)
- ❖ Click on *Delete Outstation(s)*

To add a group

- ❖ Enter the 5 digit group, using 'X' (uppercase)
- ❖ Click on *Add Outstation(s)*. The new group will now be displayed in the list.

To download the programming data

- ❖ Make sure the Base Station is connected to the computer.
- ❖ Click on the *Program Highsite* button.

The programming information will be downloaded into the Base Station. The Base Station will then re-initialise and resume operation with the new settings.

If the message *NO RESPONSE FROM HIGHSITE* is received, check the RS232 port connection.

Forwarding of Alarms from other Repeaters

Repeaters can be programmed to forward alarms from other Repeaters. This allows for alarms from distant outstations to be routed to the the control room. Refer to the section on *Planning the Network* above.

To enter a Repeater to be forwarded

1. Enter a three digit Repeater Number 001 to 008 into the block next to Forward Alarms.

Remember

- ❖ Repeaters are numbered 001 to 007
- ❖ Fill-in Parrots are numbered 008

2. Click on *Add Highsite*, the Repeater will be added to the list.

To delete a Repeater

1. Click on the Repeater number in the FORWARD ALARMS FROM list. The Repeater number will be highlighted.
2. Click on *Delete Highsite*

Rules for Alarm Forwarding

- ❖ Repeaters can repeat outstations
- ❖ Fill-in Parrots can repeat outstations
- ❖ Repeaters can repeat Repeaters
- ❖ Repeaters can repeat Fill-in Parrots

- ❖ Fill-in Parrots **cannot** repeat Repeaters
- ❖ Fill-in Parrots **cannot** repeat Fill-in parrots

NEVER program two repeaters to repeat eachother (eg. Repeater 001 repeats 002 - and Repeater 002 repeats 001) as this will cause a cascading event on the network.

FILL-IN PARROT



The fill-in parrot is used to get signals from 'difficult to get to' outstations. Fill-in parrots will repeat the signal from outstations but not from each other or repeaters.

The fill-in parrot is not intended to be mounted in a highsite environment which contains other equipment with radio transmitters.

Fill-in parrots are numbered 008 on the network.

Overview

The IRC Fill-In Parrot has the following features :

1. Reception of alarms from transmitters and forwarding to the Base Station(s) or Repeaters.
2. Reception of standard dry contact alarms or full Contact ID alarms.
3. Can be programmed to forward Commands and Queries to bi-directional outstations.
4. RS232 ports for programming.
5. Selective selection of groups of outstations which can be received allowing for multiple Fill-in Parrots to be installed on the same network.

Installation

The repeater requires the following connections

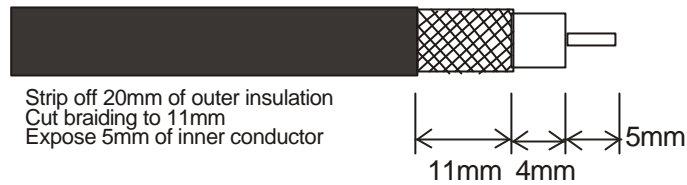
1. 220V AC power. The Fill-in Parrot has its own internal battery and charger which should provide approximately 1 day of operation without power.

OR

2. An antenna connection. A terminal contact is provided inside the unit for connection to a RG58 coaxial cable or a whip antenna.

Antenna Installation

If an external antenna is to be used, strip the coaxial cable as shown and screw the braiding and inner conductor into the clamp and terminal on the unit.



Because the Fill-in Repeater has a transmitter, the antenna should be properly matched. A through-line wattmeter should be used to confirm antenna matching.

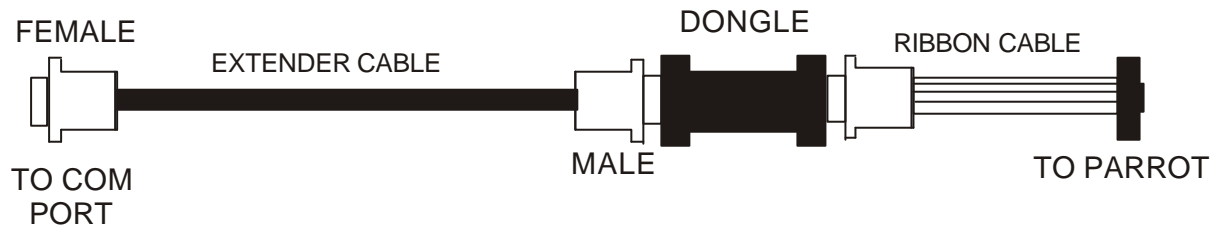
Note that the Fill-in Parrot is not designed for highsites alongside other equipment

Other transmitters operating on the highsite may interfere with the receiver on the Fill-in Parrot, thus degrading its range performance or even totally blocking signals from outstations from being received. Consult a highsite specialist for assistance.

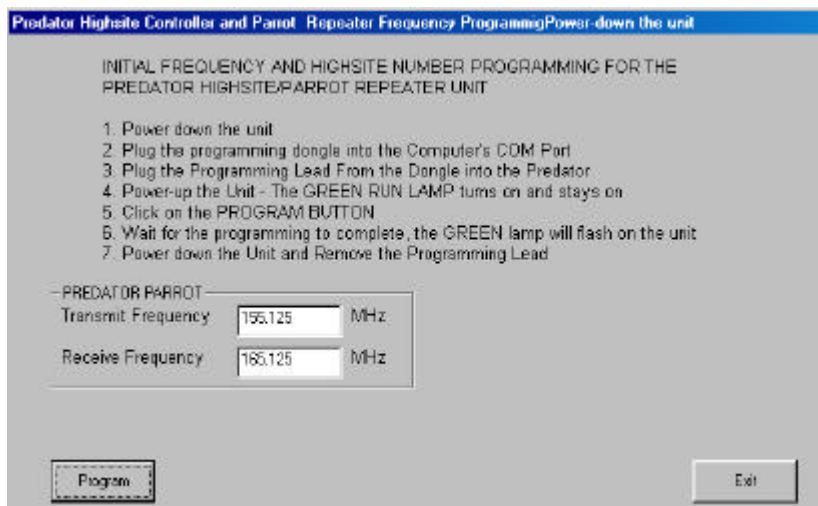
Programming the Fill-In Parrot

Programming the Frequencies into the Fill-in Parrot

The Fill-in Parrot programming is done via PC using the standard Predator Programming Cable and Dongle supplied



The frequency of operation has to be programmed into the Fill-in Parrot.



- ❖ Run the HIGHSITE program.
- ❖ Select the correct COM port.
- ❖ Click on the *PROGRAMMING* button. The programming screen will be displayed.
- ❖ Make sure that the Parrot *Number* '8' is selected, and that the type of unit selected is *PARROT REPEATER*.
- ❖ Power-down the Fill-in Parrot.
- ❖ Plug the programming cable from the computer COM Port into the Fill-in Parrot.
- ❖ Power up the unit.
- ❖ The Green RUN lamp will turn on and remain lit.
- ❖ Click on *Program Frequencies*.
- ❖ Enter the Transmit and Receive Frequencies (normally the same).
- ❖ Click on *Program*.
- ❖ Wait for the programming to finish and for the Green Lamp to Flash.
- ❖ Power down the Parrot Repeater and remove the programming lead.

Changing Groups of Outstations

The groups of outstations that the Repeater will respond to can be changed. The default is **all outstations**.

Up to 50 groups of outstations can be entered in the list. The 'X' character is used as a 'wild-card'

For example

XXXXX	Respond to all outstations (00001 to 99999)
0XXXX	Respond to all outstations starting with a zero (00001 to 09999)
00XXX	Respond to all outstations starting with 00 (00001 to 00999)
01XXX	Respond to all outstations starting with 01 (01000 to 01999)

Limiting the groups of outstations in a Repeater allows more than one Repeater of the same number to be put on a frequency.

To delete a group

- ❖ Click on the group (highlighted blue)
- ❖ Click on *Delete Outstation(s)*

To add a group

- ❖ Enter the 5 digit group, using 'X' (uppercase)
- ❖ Click on *Add Outstation(s)*. The new group will now be displayed in the list.

To download the programming data

- ❖ Turn on the Fill-in Parrot.
- ❖ Plug in the Programming Cable. The transmitter will come on for five seconds.
- ❖ Make sure the other end of the programming cable is connected to the computer.
- ❖ Click on the *Program Highsite* button.

The programming information will be downloaded into the Fill-in Parrot. The Fill-in Parrot will then re-initialise and resume operation with the new settings.

If the message *NO RESPONSE FROM HIGHSITE* is received, check the RS232 port connection.