

## **Nortel Norstar systems information guide**

This guide has been written to briefly explain the history and hardware / software on the Meridian Norstar range of phone systems.

### **History**

The manufacturer Nortel and BT had a partnership in the 90's to allow Nortel to supply and for BT to install / maintain as sole distributor in the UK. Although the Norstar range was developed in Canada and was originally sold in North America, along with other countries such as Australia etc, the software used in the UK systems were specifically designed around UK guidelines and PSTN rules with the  logo on the equipment and it was also known as Meridian Norstar.

The concept of Norstar system range was for them to be programmed via an extension phone terminal and also to provide two levels of programming access. One was for the engineering Installer (CONFIG) level, and one for the customer (ADMIN) level. The systems were usually supplied with default programming enabled such as all extensions enabled and all lines present. The extension numbers tended to be 21 onwards for the smaller systems and 221 onwards for the larger ones.

The partnership between Nortel and BT came to an end about the same time that the replacement for Norstar arrived in the form of the BCM range. These systems were in essence Norstar programming put onto a new chassis that was data cabinet rack mounted and with IP capability so that you could access it via the Ethernet and it also supported IP Trunks and Phones etc. It still retained the same Norstar phones and terminal access was still available.

### **Hardware differences**

The first model was known as the Norstar Compact 6+16 or the 4+8 i.e. 6 analogue lines and 16 digital extensions. The difference in the two systems was actually the small cord between the main and bottom unit. Upgrades from 4+8 to 6+16 were dead easy.

Most Norstar's will have analogue trunks and these will be loop calling and probably be tone dialling. Later and bigger Norstar's (Modular) might use Earth calling or Ground Start trunks. The later Modular and Compact plus systems also supported ISDN 30 trunks and these tended to mainly be DASS although ISDN30e (I421) arrived at the final software release.

The original Compact 6+16 systems have all their connections in the lower box that requires a screwdriver to open it. Inside the lid is a picture showing where all the connections are. It's easy to follow. All Norstar systems tend to use port numbers rather than extension numbers in their labelling. I'll explain later on how to do basic tests.

As all extensions are 2 wire digital terminals. Pins 3 and 4 are used in a standard BT socket and it's not polarity sensitive, so the wires can be swapped over. You can have analogue phones on the system, but you need to have a digital to analogue module fitted. These are known as ATA's or Analogue Terminal Adapter. It's a box that has a mains transformer and it's a two wire cable to the Norstar wiring frame and another two wire cable to Pins 2 and 5 in a standard BT master socket.

Remote access is available, but it was tightly controlled via BT's own Norstar support team for use in the UK as the "RAD" software was specifically designed to a higher security standard than is currently used elsewhere. Very few sites have remote access because a module for this is required, along with a spare DDI or exchange line. However, I've done a workaround on this topic near to the end of this guide.

### **Pictures of some of the different Norstar systems that were used in the UK**

I've added in a few photos below showing you the different Norstar system types available.



Norstar Compact 6+16 phone system with the power unit and CPU cover opened up



Norstar Compact plus system with CPU card and trunk cards inside the cover



Norstar Modular 0+32 system with wiring boxes on the left



Norstar ATA module on the left and an external bell ringer on the right

## General fault finding and useful tips

Most Norstar faults are either line or extension problems.

### Line faults

The smaller systems will tend to only have analogue loop calling lines, but some of the larger ones may have earth calling instead. Treat all line faults as any other phone system, except for Earth Calling as you might need to check the polarity first and compare it to other analogue lines. If necessary, reverse the wires and check again. Usually the Norstar system will automatically enable the trunk again.

Modular and later Compact plus systems might have ISDN 30 lines. These are digital trunk cards located inside the main unit and you should only be seeing green LED's. As a rule any other colour such as Orange tends to indicate that it is a problem with the ISDN line provider. Any message on the Norstar phones such as "No lines free" means it's not connected.

There are cases, where the analogue line port fails and it might be possible to move the line to a spare position and reprogram it from the admin phone terminal.

### Extension faults

There are a variety of different digital phones. For programming, try and look for a M7310 or M7324. The smaller systems might only have a M7208 that you can use. The basic model is a M7100. As with most phone systems, you can swap over handsets, cords, Telephone leads etc. They are common items. As these phones may be quite old, it's known for some of the buttons to stick and therefore you can unplug the phone and simply press all the buttons and switch hooks etc in case one or more are sticking etc.

To find out what the extension number and port number is on a phone, follow the instructions below.

From the phone, look for the button called "**Feature**" or one that shows a symbol

(Nortel one I think?) and then \*0

The display should show "Key Enquiry" followed by "Press a Key"

Press the "Intercom" or bottom key, depending upon what model phone you have and the screen should show you the extension number and perhaps a name for it. Also press the "#" hash button to display the port number. From this, you can find the extension at the wiring box.

Whilst you have "Press a Key" on the screen, you can also select other buttons if available to see what is programmed against them. It's fairly easy to change some of the features via the phone.

I've detailed below 3 useful programming requirements that have been frequently requested by most customers when changes are needed. The examples were based on the Norstar 6+16 systems and the later systems are slightly different when logging in, but it's almost the same process.

# Programming Overlay card for the Norstar digital phones

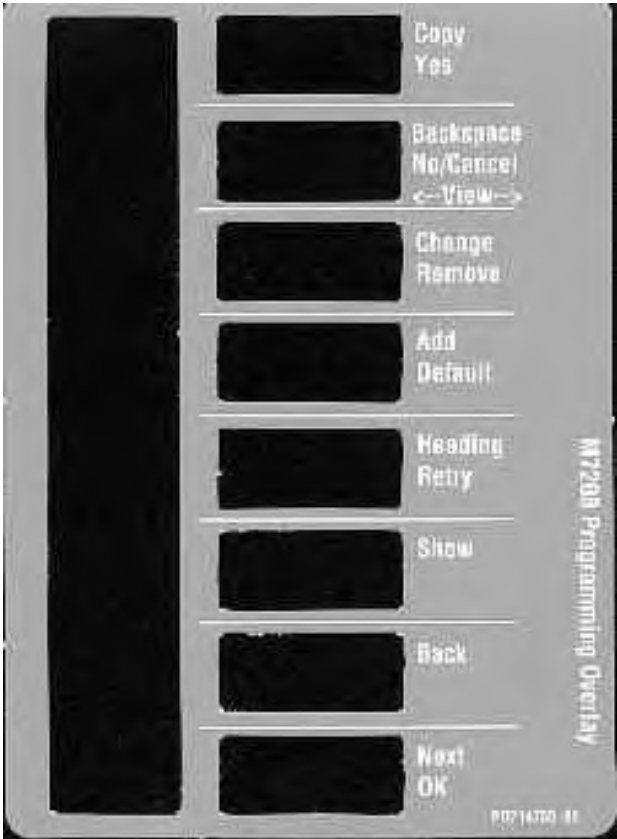
ON THE M7310 OR M7324 TERMINAL, THE GREY NORSTAR PROGRAMMING OVERLAY CARD IS PLACED OVER THE TOP 4 BUTTONS BELOW THE "TIME AND DATE" DISPLAY. (M7324 ON TOP RIGHT HAND SIDE OF TERMINAL)

AS FOLLOWS...

|       |         |  |      |  |
|-------|---------|--|------|--|
| ----- |         |  |      |  |
|       | HEADING |  |      |  |
|       | BACK    |  |      |  |
|       |         |  | SHOW |  |
|       |         |  | NEXT |  |
| ----- |         |  |      |  |



Here is the template that is required for the smaller M7208 digital terminals. It's only really used on the Compact 6+16 systems and is a little tricky to use.



## MERIDIAN NORSTAR ADMIN SECTION SYSTEM SPEED DIAL

### INSTRUCTIONS FOR PROGRAMMING SYSTEM SHORT CODE NUMBERS

#### NOTE!

DO NOT PICK UP THE HANDSET DURING PROGRAMMING. ALSO THE PHONE WILL NOT BE ABLE TO MAKE OR RECEIVE ANY CALLS.

#### USING A M7310 OR M7324 TERMINAL

#### DISPLAY

|                                                                                                                                                      |                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| PRESS THE "FEATURE" BUTTON                                                                                                                           |                                         |
| ENTER ** 23646 (SPELLS ADMIN)                                                                                                                        | Password:                               |
|                                                                                                                                                      | RETRY                                   |
| ENTER 23646 (OR OWN PASSWORD)                                                                                                                        | 1.Sys speed dial                        |
| PRESS SHOW                                                                                                                                           | Speed dial :_                           |
| PRESS NEXT OR ENTER 1st SPEED<br>DIAL NUMBER ** i.e. No's 01 TO 70                                                                                   | Speed dial :**                          |
| PRESS SHOW<br>(STORED NUMBER COULD BE LISTED)                                                                                                        | No number stored<br>CHANGE              |
| PRESS CHANGE<br>AND ENTER FULL TELEPHONE NUMBER                                                                                                      | **:<br>BKSP OK                          |
| PRESS OK                                                                                                                                             | **:<br>CHANGE                           |
| PRESS NEXT                                                                                                                                           | Use prime line<br>CHANGE                |
| PRESS NEXT                                                                                                                                           | Display digits:Y<br>CHANGE              |
| PRESS CHANGE TO "N" IF A NAME IS TO<br>BE DISPLAYED INSTEAD OF ANY DIGITS.                                                                           |                                         |
| PRESS NEXT                                                                                                                                           | Name                                    |
| PRESS SHOW                                                                                                                                           | Sys Spd Dial **<br>CHANGE               |
| PRESS CHANGE AND ENTER NAME USING<br>THE KEYPAD (UP TO 16 CHARACTERS) &<br>PRESS ARROW ON RIGHT OR "GATE" TO<br>MOVE THE CURSOR TO THE NEXT POSITION | <--- BKSP --->                          |
| PRESS NEXT                                                                                                                                           | Bypass rest'n: N<br>CHANGE              |
| PRESS CHANGE TO "Y" IF YOU WANT TELEPHONES WHICH ARE BARRED<br>FROM OUTGOING ACCESS TO ONLY BE ALLOWED TO USE THAT SPEED<br>DIAL NUMBER CODE.        |                                         |
| PRESS NEXT (& PRESS SHOW IF REQD<br>TO PROGRAME NEXT TELEPHONE NUMBER)                                                                               | Speed dial:**<br>(START OF NEXT NUMBER) |
| TO EXIT FROM PROGRAMMING PRESS THE<br>RED/ORANGE "RLS" BUTTON                                                                                        | End of session                          |
| NORMAL TELEPHONE OPERATION                                                                                                                           | TIME AND DATE                           |

## MERIDIAN NORSTAR ADMIN SECTION NAMES

### INSTRUCTIONS FOR PROGRAMMING NAMES ONTO EXTN PHONES

#### NOTE!

DO NOT PICK UP THE HANDSET DURING PROGRAMMING. ALSO THE PHONE WILL NOT BE ABLE TO MAKE OR RECEIVE ANY CALLS.

#### USING A M7310 OR M7324 TERMINAL

#### DISPLAY

PRESS THE "FEATURE" BUTTON

ENTER \*\* 23646 (SPELLS ADMIN)

Password:

RETRY

ENTER 23646 (OR OWN PASSWORD)

1.Sys Speed Dial

PRESS NEXT

2.Names

PRESS SHOW

Extn names

PRESS SHOW

Show extn: \_

OR PRESS NEXT

Line names

AND THEN SHOW TO CHANGE

Line names (01-08 or 001-094)

Show line: \_

ENTER EXTN NUMBER OR PRESS NEXT TO  
SHOW FIRST EXTN NUMBER i.e. EXTN 21

21: 21

CHANGE

PRESS CHANGE AND TYPE IN NAME USING  
KEYPAD (UP TO 7 CHARACTERS) PRESS  
ARROW ON RIGHT OR "GATE" TO MOVE TO  
NEXT SPACE (BKSP = BACKSPACE 1 CHARACTER)

21: XXXXXXXX

<--- BKSP --->

PRESS NEXT TO GO TO NEXT EXTN NAME

22: YYYYYYYY

CHANGE

CHANGE NAME IF REQUIRED

TO EXIT FROM PROGRAMMING PRESS THE  
RED/ORANGE "RLS" BUTTON

End of session

NORMAL TELEPHONE OPERATION

TIME AND DATE

**MERIDIAN NORSTAR ADMIN SECTION TIME AND DATE**

**INSTRUCTIONS FOR PROGRAMMING TIME & DATE ONTO ALL PHONES**

**NOTE!**

DO NOT PICK UP THE HANDSET DURING PROGRAMMING. ALSO THE PHONE WILL NOT BE ABLE TO MAKE OR RECEIVE ANY CALLS.

**USING A M7310 OR M7324 TERMINAL**

**DISPLAY**

PRESS THE "FEATURE" BUTTON  
ENTER \*\* 23646 (SPELLS ADMIN)

Password: RETRY

ENTER 23646 (OR OWN PASSWORD)

1.Sys Speed Dial

PRESS NEXT

2.Names

PRESS NEXT

3.Time and Date

PRESS SHOW

Time \*\*: \*\*  
CHANGE

PRESS CHANGE

Hour: \*\*  
CHANGE

PRESS CHANGE AND KEY IN HOUR USING  
KEYPAD OR GO TO NEXT STEP

PRESS NEXT

Minutes: \*\*  
CHANGE

PRESS CHANGE AND KEY IN MINUTES  
USING KEYPAD OR GO TO NEXT STEP

PRESS NEXT  
PRESS CHANGE TO ALTER SETTING

AM or PM  
CHANGE

PRESS NEXT

Date 01 Jan 01  
CHANGE

PRESS CHANGE

Year: \*\*  
CHANGE

PRESS CHANGE AND TYPE IN YEAR  
USING KEYPAD OR GO TO NEXT STEP

PRESS NEXT

Month: \*\*  
CHANGE

PRESS CHANGE AND TYPE IN MONTH  
USING KEYPAD OR GO TO NEXT STEP

PRESS NEXT

Day: \*\*  
CHANGE

PRESS CHANGE AND TYPE IN DAY  
USING KEYPAD OR GO TO NEXT STEP

PRESS NEXT

4. Direct dial  
or (4. Restrictions)

TO EXIT FROM PROGRAMMING PRESS THE  
RED/ORANGE "RLS" BUTTON

End of session

NORMAL TELEPHONE OPERATION

TIME AND DATE

## **System and Hardware problems**

Generally speaking, over the years, there aren't any major problems found with this type of phone system. The later software versions can be harder to reprogram as more features and functions became available.

The design concept meant that all Norstar systems had a software cartridge somewhere on the CPU. I've never known them to fail, but I have had cases where the power unit has failed and the programming is retained there. This meant that a total reprogram was needed. However you can unofficially cheat and remove the power unit from the plastic casing if you are careful. Please refer to a section near to the end on how it's done on a Norstar 0+32 system.

One useful tip here is to always look for the time and date. The digital phone should display this as standard. If the date has changed to something like 1<sup>st</sup> April 1993, then it's a sign that the Norstar programming has defaulted back to "day one" factory default, due to a power cut and that the lithium battery inside the CPU has perished. In this case, the whole CPU needs to be changed out as the battery is soldered onto the board and isn't replaceable.

If the fault is that all phones are flashing, then the system might be corrupted. It's worth getting the customer to power down the system for 5 minutes, before trying again. I've known one of the extension or trunk modules to fail and they can be disconnected and replaced without losing the programming. Be careful when touching the fibre cables. You should only connect them when the main power supply is turned off.

## **Modular systems with add on modules fitted**

Norstar Modular systems, 8+24 or the 0+32 versions were designed to have more capacity for lines and extensions such as in the photo below. A total of 6 add on modules could be fitted and these could be any trunk or extension combination depending upon what 2 or 6 port fibre was fitted in the main cabinet.

When looking or working on the modules, the programming should be setup so that all of the trunk configuration is connected on the last fibre ports and they work down towards the beginning of the fibre ports, whereas any additional extension ports start from the bottom and work upwards. This is because the numbering range increases in sequence from the initial extensions in the main CPU cabinet.

Each module requires a power lead and they tend to be all put together in one power block inside the trunking that runs below the modules. All the modules should have a Red power light showing at the top. The module covers can be flimsy but be careful not to pull out any of the fibre cables or disconnect the power from the module.

The example below shows 3 modules. The one with 3 cards in it is a 12 port analogue line module and each trunk card contains 4 trunks. The other two modules are both digital extensions with 16 ports each. All the modules are linked to the main CPU unit via fibre cables which don't normally fail.



### Add on applications

Nearly all of the Norstar systems were installed as single site installations, but some also add private wire (AC15) modules fitted. A few might have voicemail fitted, known as Startalk and a Call logging unit might be fitted in some cases. All these devices used an extension port for connectivity. Only basic facilities tend to be available for them.

Some sites had an ITTEL system called "ACD for Norstar" that was wired onto the extension ports as shown below on the right.



## **Software and upgrades**

The major problem with Norstar systems for almost the entire range is that they weren't able to allow the extension to forward their number externally to an outside number such as a mobile phone or voicemail etc. In other countries, this can be done. At the time that the Norstar systems were sold in the UK, the law prohibited any trunk to trunk calls and the software wasn't changed, even when the restriction was lifted a few years later as ISDN 30 became available.

The other complaints were that the first two releases of 6+16 and 8+24 systems had Call Waiting built in and this annoyed customers when on a call for another one to also ring the phone. Version 3 onwards had a feature called "Do not Disturb on Busy (DNB) to stop this.

If there is a requirement to carry out an upgrade, then it's OK to upgrade one release at a time, but if you jump two releases or go back a version, then be aware that all the programming will be lost!

## **Norstar feature codes and commands**

There are many commands to use on Norstar and BCM phones. The few listed below are common ones that can be applied. Feature \*3 will also require additional feature codes when entering in a new feature on that button such as Feature 66 for a voice call function.

### **General Features**

Feature \*0 is used for key Inquiry

Feature \*3 is used for digital set key programming

Feature \*4 is used to program personal speed dial numbers

Feature \*6 Allows users to set the ring type for the telephone 4 ring types are available.

Feature \*7 Allows users to set a different contrast level on the telephone display

### **Individual Button Features**

Feature 0 Speed Dial. Users can dial numbers from system or telephone speed dial entries

Feature 4 Call Forward to forward their phone to another extension internally. Use #4 to cancel

Feature 5 Last Number Redial will redial the last dialled number made.

Feature 66 Voice Call allows users to make a voice call to other users in the system.

Feature 74 Call Park. Dial code 101 to 125 to retrieve a call. Default numbers are 101 to 125.

Feature 75 Call Pick-up. Users can pick up a call ringing at another system telephone.

Feature 77 Call Duration Display duration of last or current outside call

Feature 805 Phone Test allows the user to test the phone set. Display, buttons, speaker & handset.

Feature 85 Do Not Disturb. When activated, a phone will appear busy to other phones & won't ring

### **Additional features**

Nearly all of the features that are available can also be used without a button by just pressing "Feature" and then the code required. Also to cancel a feature, just enter in # before the code number so that e.g. Feature 85 would activate DND & Feature #85 to cancel it back to normal again.

## Norstar Remote access module

Here is some information I've done on accessing a Norstar system via a remote access device if the RAD module is available.

Some of you may know that I've had some experience in testing with the Nortel Norstar systems by using the Norstar Remote Utilities Version 11 tool. It's possible to access all Norstar systems. However the main thing to be aware of, is that you need to use a Norstar Modem called an "E-Rad". In the States, it's known as a FastRad. I think the "E" stands for European & the rest = Remote Access Device.

There were a number of sites which had these Modems fitted although most were just left still wrapped in the box. The E-Rads were only designed to be used by "BT" for their own exclusive use. This was because they had a comprehensive system designed to access the systems using a higher level of security than the FastRad used in the States.

However, all is not lost. I've got a small file called a "fastrad.exe". This program was issued in the States to upgrade a FastRad to allow it to work over ISDN trunks. This same program can also be used to **"downgrade"** an E-Rad. The reason for this is that the NRU 11 software & FastRad only supports passwords with numbers & the UK E-Rads have to have letters & numbers within the password. By downgrading the modems, it then allows you to access them with the NRU 11 software. The other thing that is required will be the "map" files for the UK systems. These files were issued for the Compact & Modular plus versions. I have got most (if not all) of the UK ones in a zip file. Once the NRU 11 software has been successfully loaded, and then unzips the new Map files to add/replace in the "Map" folder.

The good thing about the later "plus" type software versions is that you can look at these systems via the NRU's own Browser. This browser is just like the older style BCM one.

Another useful point is that it also has a backup & restore feature. I've tried it out on a Compact Plus system & it works fine.

If you look at the photos below of an E-Rad, then my request is for you to recover any E-Rads that you find on site & get them downgraded. The problem is that you need to have a pc running Windows 98 or older. I've tried using XP, but had problems. The downgrade process takes around 6 minutes to do. If you can send any E-Rads to me, then I can downgrade them for you & post them back out to you.



Front View



Rear view

Although the Norstar range has been around for a very long time now, they are just in general an older version of the Nortel/Avaya BCM phone system. All programming is done via a M7310 / M7324 phone.

Where sites would be suitable for remote accessing, I'd advised a spare DDI line be assigned to the E-Rad, or a Trunk line that would normally just ring on once the office is closed. This is because the RAD programming works by using one Line only for access & you can select the number of rings before it answers. I would also suggest a Modem password of 12345678. The Modem can be manually answered by a person who would then press Feature 9\*0 (I think!). This would activate the Modem. This method is messy & I would avoid its use.

Here are a few notes that I had on using some of the Feature 9\* codes.

F 9\*\* (RADMIN) = RAD (REMOTE ACCESS DEVICE) FITTED  
F 9\*0 = TURNS ON MODEM FOR RAD IF FITTED  
F 9\*1 = STARTALK (VOICEMAIL FITTED)  
F 9\*2 = CLI (CALL LOGGER INTERFACE) FITTED

**NOTE!**

PROGRAMMING THE REMOTE ACCESS DEVICE CAN ONLY BE DONE FROM A M7310 OR M7324 TERMINAL, BUT THE MODEM CAN BE TURNED ON OR OFF FROM ANY PHONE WHEN CONNECTED TO AN EXCHANGE LINE OR PRIVATE WIRE (AC 15).

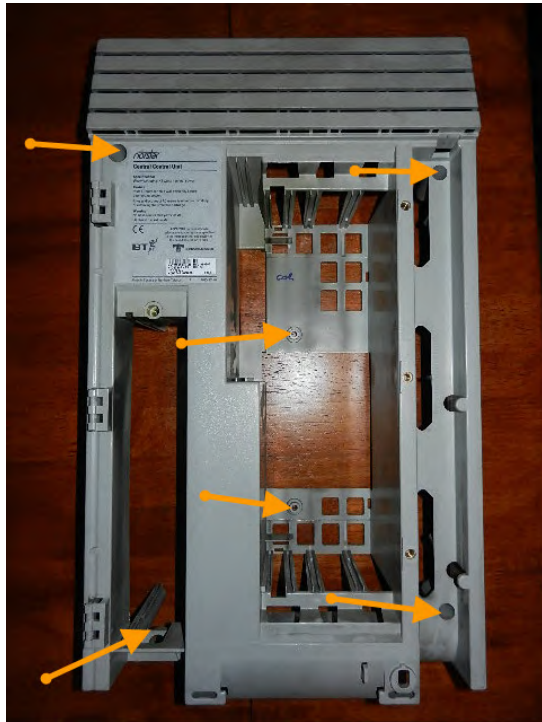
ALSO WHEN USING ANY OF THE "FEATURE 9\*?" CODES, THE DISPLAY WILL SHOW "INACTIVE FEATURE" IF YOU SELECT A CODE WHICH DOES NOT HAVE A DEVICE CONNECTED. EG 9\*2 = CALL LOGGER.

THE CALL LOGGER CANNOT BE PROGRAMMED WITH A M7100 PHONE.

## How to replace the power unit on a Norstar 0+32 system

This may help in future if the Norstar CCU power unit fails and will stop you having to re programme everything from Scratch again.

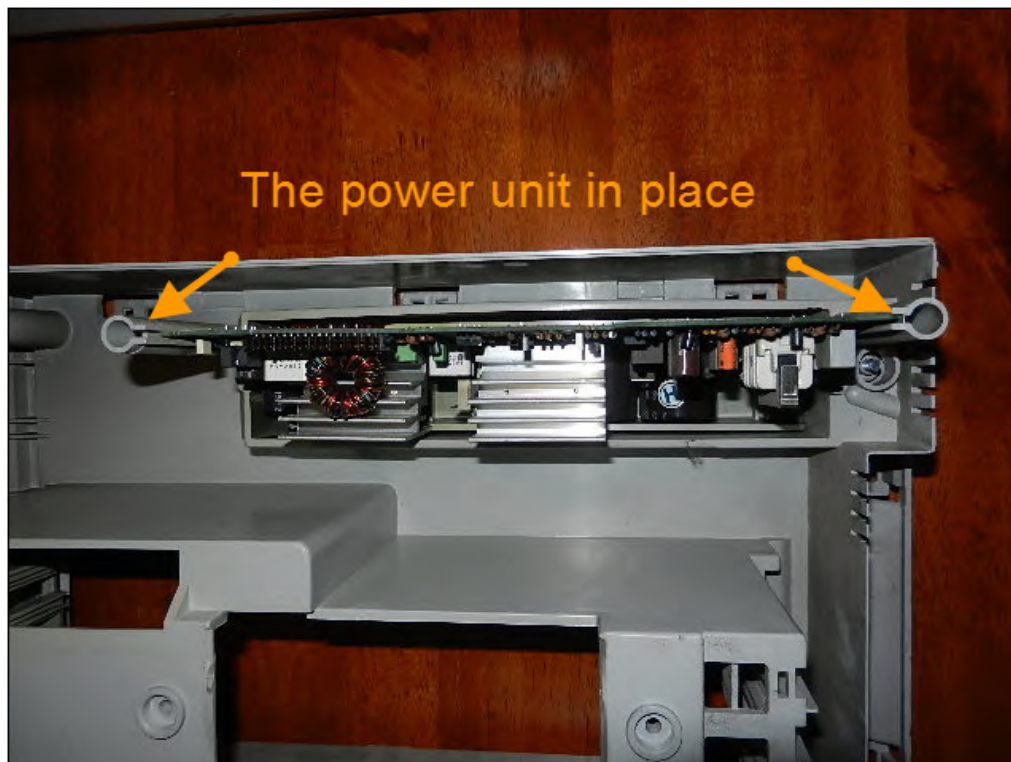
Below are the screws you need to remove from the old and new unit. You have to strip the unit down to get to the two screws behind all the cards. This allows you to split the front from the back of the unit.



With the front removed you can exchange the front with the GOOD power unit.



You can push the power unit out. I found it impossible to pull out unless you pushed it from this angle.



This is the power unit removed



I hope this helps you in replacing the power unit on the Nortel Norstar system.