

February 6, 2002

Log #: AN-0027

## Connection to Fujitsu 9600 Rel. 13 Patches LP1-LP17

### 1. Overview

**Intended Audience:** Fujitsu 9600 PBX System Administrators or persons having commissioning knowledge of Fujitsu 9600 PBX. This Fujitsu 9600 was equipped with a voicemail system call Callegra by Callware with version 5.5 software installed.

This document contains configuration information that may be used as a guide to configure the PWT Mobility Server to the **Fujitsu 9600** PBX.

The following sections are also provided:

**General Overview**                      **See Section 2.1**  
This section describes the system configuration at the time of testing.

**Connections to T1 Q-SIG**              **See Section 2.2**  
This information will be made available in a later revision of this document.

**Connections to T1 5ESS** **See Section 2.3**  
Configuration information available in this document.

**General Information**                  **See Section 2.3**  
This section also includes voice mail configuration information

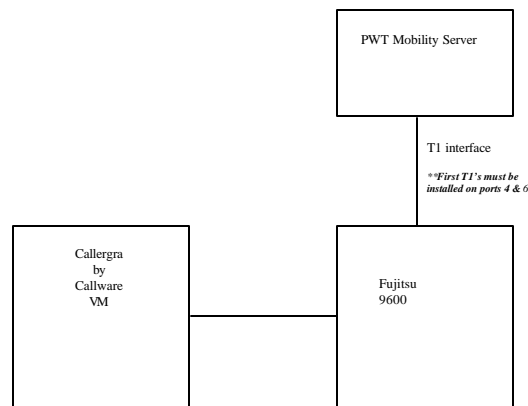
### 2. Technical Discussion

#### 2.1 General Overview

Figure 1 provides a high level overview of the system used to create the 5ESS section of this document. The voicemail system connected to the 9600 at the time of testing was a Callegra by Callware, please refer to section 2.3.6 for details on the voice mail system and system inter-working.

February 6, 2002

Log #: AN-0027



Fujitsu 9600 & Callergra VM Interconnect Block Diagram  
Figure 1

## 2.1.1 Billing

To facilitate complete PBX call detail records, the PWT Mobility Server will deliver the user's CPN (Calling Party Number) to the PBX over the PRI trunk. This CPN for most billing systems is 5 or 6 digits (internal dialing plan). Therefore, since all public calls are made through the PBX, the PBX must append the area code and NXX in front of calls made to the public network.

If the PBX can not add the area code and NXX to the user's CPN before delivering the call to the private network, the PWT Mobility Server must deliver 10 digit CPN on all non-private network calls. If this is the case, calls made to internal numbers will have billing records with extension numbers recorded and calls to outside numbers will have 10 digits recorded.

Billing reports were not verified on the system under test. This customer did not have an on-site billing system; the local CO (Central Office) handled all billing. Therefore only calls out-going to the PSTN were recorded and tracked.

## 2.1.2 Calling Party Number (CPN)

To route calls to the public network, through the PBX we must select Public local/national in the routing tables of the PWT Mobility Server. This enables the correct display of CPN information to the public network.

\*\*\* The customers billing records will now have extension length numbers and 10 plus digit numbers representing the same user.

February 6, 2002

Log #: AN-0027

### 2.1.3 Alternate Routing

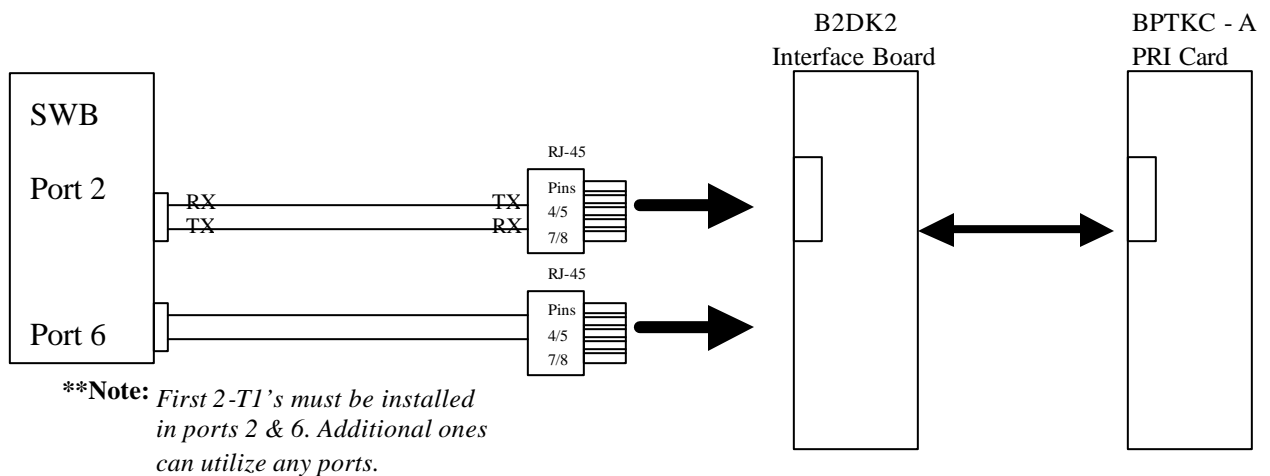
Alternate routing in the Fujitsu PBX is possible. If the PWT Mobility Server link fails under any condition, the Fujitsu PBX can re-route the call to an operator position by setting up a loop-back truck that automatically dials a predetermined number. The PBX requires additional hardware to support this (e.g. two PRI boards (BPTK2-B) and two interface boards (BPTKC-A)).

### 2.1.4 Call Diversion

Call forwarding conditions and their destinations (diversion points) must all be set to 0 for desk phones used in PWT Mobility Server profiles for call forwarding and concurrent ringing.

### 2.1.5 Hardware

Interconnection to the Fujitsu 9600 PBX is only supported by a T1 interface. Figure 2 below details the cabling required to interconnect the Mobile Advantage to the 9600. Interconnection is made to a PRI board (BPTK2-B) through an interface board (BPTKC-A). The interface board provides a hard loop-back in the event the PBX fails. The Callegra by Callware voicemail system is connected to the 9600 via a serial connection. The PWT Mobility Server has no direct connect to the VM system, all interaction with the system is via the PBX.



Detailed T1 PRI interface to 9600

Figure 2

February 6, 2002

Log #: AN-0027

## 2.2 Connections to T1 Q-SIG

The Fujitsu 9600 PBX can support T-1 Q-SIG. At the time this document was created, the Q-SIG interface was not available and therefore not tested. This section will be updated once testing is completed.

## 2.3 Connections to T1 5ESS

### 2.3.6 Voice Mail

When a user absent profile is active, is busy on their phone, or does not answer, the PWT Mobility Server will route the caller to the user's voice mailbox. To accomplish this, the PWT Mobility Server call forwards the caller to a predetermined voice mail number. Once an off-hook is detected PWT Mobility Server out-pulses a DTMF string identifying which mailbox should be accessed. The caller then records the message in the user's personal mailbox.

The Customer level Default Voice Mail Address *should not be* configured with any number.

The End user level: Voice mail address should contain the main voicemail number, Voice mail Subaddress should be blank, Voice mail Subaddress should contain '#'. The Absent profile of the user should contain the direct dialed number for their mailbox.

The above configuration is used to support two different voicemail dial-up numbers. One for depositing messages and the other for retrieval of messages.

#### 2.3.6.1 Message Waiting Configuration overview

To notify a Personal Number user that a message was left in their mailbox, the pager notification function or out calling option of the voice mail system is used. To accomplish this a predetermined (Normally non-DID number) pager dial-up number is assigned in the PWT Mobility Server and routing is defined in the PBX. Also each user's mailbox must be configured to support the pager notification and configured as follows:

The following is an example:

Pager dial-up number = 27500 (pilot number)

User's extension number = 27000

Pager notification option entry = 27500^^27000 disconnect. (^ = Pause).

When the PWT Mobility Server receives a call on 27500 it will answer. The voice mail system is expected to send the user's extension information. Once this information is received, the PWT Mobility Server will activate the message-waiting indicator on the user's phone. If the user has a desk phone as well, the voicemail system can be configured to illuminate the message waiting indicator on the desk phone\*\* as well.

\*\*Note: Some voicemail system will not support illuminating the lamp on a desk phone of a different number than the mailbox. If this is the case, some systems have a work around that allows a phantom mailbox to be configured, to support illumination of the desk lamp.

February 6, 2002

Log #: AN-0027

The message waiting pilot number can be configured to answer the incoming call from the voice mail system two ways. The first is off-hook followed by quiet termination. This option is used when the voice mail system is not capable of detecting a pager tone. The second option is off-hook followed by a pager tone. (three short tone bursts). This option is preferred if the voice mail system supports the pager tone detection as a handshake to send the user's extension number. If tone detection is not possible, pauses must be inserted between the pager dial-up number and the user's extension number. Depending on the traffic activity in the PBX and the voice mail system, pause length will vary.

### **2.3.6.2 Voice Mail Access – Two Different Numbers for voicemail interface (Callegra by Callware)**

The Callegra by Callware Voice Mail system can be configured to work with the system two ways. The first way is a single main access number, followed by indexing into the proper mailbox. The second way is to assign each user a unique DID number in the voicemail system. This number is then assigned as a phantom number in the PBX and pointed to the VM system.

The configuration used during the generation of this application note is as follows:

1. Each user was assigned a unique mailbox number. This number was not the same as their published number (i.e. Personal number). This allowed the user to access their mailbox directly from outside the company, without going through the main pilot number in the voice mail system.
2. Each user desk phone was assigned the same last four numbers as their Personal number and their mailbox \*\*. This configuration allowed the user to retrieve their messages from the desk phone with a softkey.

\*\*Note: The Callegra by Callware voicemail system was configured to look at the last four digits of number that called it. If those digits matched a mailbox, the call was indexed into the mailbox that contained those digits.

#### **To Retrieve Voice Mail:**

To retrieve a message, the user needs to dial the personal assistant number, then enter their personal number (if user using their PWT phone, no personal number is required) followed by their password. A system announcement will notify the user they have a new voicemail messages. The users then selects option 4. By doing this, the message waiting indicator on the PWT phone will be reset.

#### **To Leave Voice Mail:**

The 9600 system and Callegra voicemail system work different then past systems. When leaving a message the caller is call forwarded to the users personal mailbox (DID number). This DID number is entered in the users absent profile and no Subaddress number is entered in the End Users section.

### **2.3.6.5 MWI Delivery using Fujitsu Voice Mail System**

The Fujitsu Voice Mail system supports a feature called outcalling. This feature is similar to that of the Octel system pager notification feature. Once this feature is activated, a voice mailbox for a PWT Mobility

February 6, 2002

Log #: AN-0027

Server user may be set to call a certain number and send DTMF tones which will activate the MWI for that user when someone has deposited a message in their voice mail box.

First, a pager notification access phone number is setup in PWT Mobility Server. Then the system parameter "pager tone" must be set to "yes" in the PWT Mobility Server. The Fujitsu Voice Mail System requires this tone. Once a message is deposited in the mailbox of a PWT Mobility Server user, the pager notification access number is dialed by the voice mail system. When the call is answered by the PWT Mobility Server pager notification feature, and the tone is sent to the voice mail system, the extension number for the personal number with voice mail is sent via DTMF over the channel. The PWT Mobility Server takes this information and activates a message icon on the user's PWT Phone indicating they have a Voice Mail Message.

### 3. Solution

Listed below is sample data-fill for the **Fujitsu 9600 PBX** to support a 5ESS connection to the PWT Mobility Server.

Setup in Mobility Server is as defined in the installation and Maintenance Manual unless otherwise noted in above sections.

```
DIS TG, 300,,0
```

```
# TRUNK GROUP DATA LIST #
```

```
TGN TYP TID TNN SPC AKI COF TLT DGN RGN COS RSM FRL TRS HNT NAME
DIS NP,,,3
```

```
# NUMBERING PLAN LIST #
```

```
Number Plan 0:General Originating Call
```

```
Access Expect Trk Dist Adj Dtrm Rt Trk
Codes digits Feature Grp Offc Dgt DgEs Dest Index DN
3 5 701:Trunk Access # 301 1
```

```
Number Plan 1:Hook Flash Originating Ca
```

```
.
Access Expect Trk Dist Adj Dtrm Rt Trk
Codes digits Feature Grp Offc Dgt DgUs Dest Index DN
3 5 701:Trunk Access # 301 1
```

```
Number Plan 4:ATT Originating Call
```

```
.
Access Expect Trk Dist Adj Dtrm Rt Trk
Codes digits Feature Grp Offc Dgt DgUs Dest Index DN
3 5 701:Trunk Access # 301 1
```

```
Number Plan 7:Tie Trunk Terminating Call
```

```
.
Access Expect Trk Dist Adj Dtrm Rt Trk
Codes digits Feature Grp Offc Dgt DgUs Dest Index DN
3 5 701:Trunk Access # 301 1
```

```
Number Plan 8:CO Trunk Terminating Call
```

```
Access Expect Trk Dist Adj Dtrm Rt Trk
Codes digits Feature Grp Offc Dgt DgUs Dest Index DN
3 5 701:Trunk Access # 301 1
```

February 6, 2002

Log #: AN-0027

END 00-01-19 WED 19:22 ( )  
DIS TRKDM,301  
# TRUNK DIGITS MANIPULATION LIST # 00-01-19 WED 19:22 PAGE-001  
TGN SKP SE DIGIT MFEDL  
301 1 0

END 00-01-19 WED 19:22 ( )  
DIS DN,,1389  
# DIRECTORY NUMBER ASSIGNMENT LIST #

DN EN Name |--- Terminal ---| Dialing  
Class Type Usage Class Type RSM FRL COS MWL

1389 \*\*\*\*\*VLT VL 1 1 1  
END 00-01-19 WED 19:24 ( )  
DIS FWD,,1389

# SYSTEM FORWARDING LIST # 00-01-19 WED 19:24 PAGE-001

TNN DN COND TYPE DSTNO -----DIALING NUMBER-----  
0 1389 AC INT 389 31389 ~ f  
1 ~EXT 389 31389 °---4  
~ ~ ~ ~le!  
EXT -  
BL INT -  
EXT -  
DND INT -  
EXT -

END 00-01-19 WED 19:24 ( )  
DIS DSTNO,389

300 5 37 0 4 0 0 0 1 1 1 1 1 0 0

END

DIS TG,301,,1

# TRUNK GROUP DATA LIST #

| TGN | TYP   | TID   | TNN    | SPC   | AKI | COF | TLT | DGN | RGN | COS | RSM | FRL | TRS | HNT | NAME |
|-----|-------|-------|--------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| AKW | AKR   | AKB   | RGT    | AOT   | GRD | REL | HKS | AFT | SHK | RHK | OPR | DMF |     |     |      |
| MIN | PRE   | MAK   | BRK    | DGT   | PST | PBO | PBF | COP | PGT | MID |     |     |     |     |      |
| PAC | MBC   | STG   | DT     | IAS   | DTS | ABS | DTK | OOB | NOC | PTF | TCS | TCR | TDT | VCM | OGF  |
| CRC |       |       |        |       |     |     |     |     |     |     |     |     |     |     |      |
| NSF | NSFFG | PRMFF | PRMFFV | CDNFG | TON | NPI |     |     |     |     |     |     |     |     |      |
| 301 | 5     | 38    | 0      | 5     | 0   | 0   | 3   | 0   | 0   | 1   | 1   | 1   | 0   | 1   |      |
|     | 0     | 0     | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   |     |     |     | 0    |
|     | 0     | 0     | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 0   |     |     |     |     | 0    |
|     | 28    | 0     | 0      | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |      |
|     | 0     | 0     | 0      | 0     | 0   | 0   | 1   | 4   | 9   |     |     |     |     |     |      |

END

CHA ISTG,301,,,,,1,4,9

END 00-01-19

DIS NP,0,,3

# NUMBERING PLAN LIST #  
TTID= 0

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Ascom

February 6, 2002

Log #: AN-0027

```
DIGIT  EDL  FNO  TGN  TGX  AJC  RDD  DOC  TTN  DN          SVN
3      5    701  301                1      0
```

TTID= 1

```
DIGIT  EDL  FNO  TGN  TGX  AJC  RDD  DOC  TTN  DN          SVN
3      5    701  301                1      0
```

TTID= 4

```
DIGIT  EDL  FNO  TGN  TGX  AJC  RDD  DOC  TTN  DN          SVN
3      5    701  301                1      0
```

TTID=7

```
DIGIT  EDL  FNO  TGN  TGX  AJC  RDD  DOC  TTN  DN          SVN
3      5    701  301                1      0
```

TTID= 8

```
DIGIT  EDL  FNO  TGN  TGX  AJC  RDD  DOC  TTN  DN          SVN
3      5    701  301                1      0
```

END

DIS TRKDM,301

# TRUNK DIGITS MANIPULATION LIST #

```
TGN  SKP  SE  DIGIT  MFEDL
301  1    0
```

END

DIS DN,,1389

# DIRECTORY NUMBER ASSIGNMENT LIST #

```
DN( EN )      NAME  CLS  TYPE  SG  RSM  FRL  COS  OT  USG  MWL
1389(***** )          VLT VL  :*      1  1  1
```

END

DIS DSTNO,389

# DESTINATION DIALING NUMBER LIST #

DSTNO -----DIALING NUMBER-----

```
389  31389
```

END

DIS FWD,,1389

```
389  31389
```

END

DIS NP,,3

# NUMBERING PLAN LIST #

Number Plan 0:General Originating Call

```
Access  Expect
Codes   digits   Feature
```

```
Trk Dist Adj Dtrm Rt Trk
Grp Offc Dgt DgEs Dest Index DN
```

February 6, 2002

Log #: AN-0027

3 5 701:Trunk Access # 301 1

Number Plan 1:Hook Flash Originating Ca

| Access Codes | Expect digits | Feature            | Trk | Dist | Adj | Dtrm | Rt | Trk |
|--------------|---------------|--------------------|-----|------|-----|------|----|-----|
| 3            | 5             | 701:Trunk Access # | 301 |      |     |      |    | 1   |

Number Plan 4:ATT Originating Call

| Access Codes | Expect digits | Feature            | Trk | Dist | Adj | Dtrm | Rt | Trk |
|--------------|---------------|--------------------|-----|------|-----|------|----|-----|
| 3            | 5             | 701:Trunk Access # | 301 |      |     |      |    | 1   |

Number Plan 7:Tie Trunk Terminating Call

| Access Codes | Expect digits | Feature            | Trk | Dist | Adj | Dtrm | Rt | Trk |
|--------------|---------------|--------------------|-----|------|-----|------|----|-----|
| 3            | 5             | 701:Trunk Access # | 301 |      |     |      |    | 1   |

Number Plan 8:CO Trunk Terminating Call

| Access Codes | Expect digits | Feature            | Trk | Dist | Adj | Dtrm | Rt | Trk |
|--------------|---------------|--------------------|-----|------|-----|------|----|-----|
| 3            | 5             | 701:Trunk Access # | 301 |      |     |      |    | 1   |

END 00-01-19 WED 19:22 ( )  
DIS TRKDM,301  
# TRUNK DIGITS MANIPULATION LIST # 00-01-19 WED 19:22 PAGE-001  
TGN SKP SE DIGIT MFEDL  
301 1 0

END 00-01-19 WED 19:22 ( )  
DIS DN,,1389  
# DIRECTORY NUMBER ASSIGNMENT LIST #

| DN | EN | Name | Class | Type | Usage | Class | Type | RSM | FRL | COS | MWL |
|----|----|------|-------|------|-------|-------|------|-----|-----|-----|-----|
|----|----|------|-------|------|-------|-------|------|-----|-----|-----|-----|

1389 \*\*\*\*\* VLT VL 1 1 1  
END 00-01-19 WED 19:24 ( )  
DIS FWD,,1389

# SYSTEM FORWARDING LIST # 00-01-19 WED 19:24 PAGE-001

| TNN | DN   | COND | TYPE | DSTNO   | -----DIALING NUMBER----- |
|-----|------|------|------|---------|--------------------------|
| 0   | 1389 |      |      | AC INT  | 389 31389 ~ f            |
| 1   |      |      |      | ~EXT    | 389 31389 °---4          |
| ~   | ~    | ~    | ~    | EXT     | -                        |
|     |      |      |      | BL INT  | -                        |
|     |      |      |      | EXT     | -                        |
|     |      |      |      | DND INT | -                        |
|     |      |      |      | EXT     | -                        |

END 00-01-19 WED 19:24 ( )  
DIS DSTNO,389

## 4. Reference

PWT Mobility Server Installation and Maintenance Manual