



## **USER MANUAL**

### **FLO Repeater**

### **Gap-fillers**

### **CGU20-50-100 Wrms**

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|                                                                                   |                                          |                     |                             |
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|  | <b>FLO Repeater<br/>CGU20-50-100W HG</b> | <b>Doc: 47N0208</b> |                             |
|                                                                                   |                                          | <b>Edition: 1</b>   | <b>Date:<br/>04/10/2007</b> |

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## 1. SAFETY INSTRUCTIONS

### 1.1. INTRODUCTION

In spite of the electric well cared used for the equipment design, the installation and maintenance personnel may be exposed to a certain inherent hazards in the electronic equipment treatment.

Since Mier Comunicaciones bets for the security of its customers, in the current chapter is pretended to offer a guide of the possible existing dangers, and a group of recommendations to avoid their development as well.


For these reasons, is extremely important to read carefully this chapter before starting any operation over the unit (chapter 1). However, someone always can get in contact with our Technical Attention Service (TAS) to solve any kind of doubt.

**NOTE:** the purpose of this section is not to contain a complete description of all the precautions that the operators must be bear in mind using electronic equipment. Mier Comunicaciones doesn't take responsibility for injuries suffered due to inappropriate and irresponsible procedures or to dispose of personnel without the experience and/or required qualification.

### 1.2. GENERAL RECOMMENDATIONS

In the next lines will be detailed some general recommendations to stick on to follow a correct security plan at the time to carry out the installation, the maintenance or any type of adjustment.

- All electrical installation and its respective maintenance must be carried out by suitable qualified personnel.
- Do not do any work in the unit unless there is another person who is able to provide first aid services.
- Do not touch overheated components without suitable precautions to avoid burns.
- If it is required to raise and to transport the unit, it must be done by more than one person. The unit weight is too high (25-30Kg depending on the unit) and it could cause injuries.
- The fuses, switches and other protection devices have the finality to guarantee security under overloads and short circuits. Pay high attention to them.
- When a security device replacement is performed, original device with the same electric specifications has to be used. When a replacement with these characteristics is done, do a security check to ensure its correct operation.
- In order to do any sort of work without operating requirement, ensure that the unit is unconnected to the supply power. In this case, not to assume

|                                                                                   |                                                |                     |                                   |
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either that electric hazard doesn't exist (even in the parts that apparently show electric isolation). The capacitors might retain dangerous electric potentials for a certain period of time after switching off the unit. Wait for 5 minutes to ensure that the capacitors have been discharged. Not to discharged them by short circuits.

- Disconnect the antenna as well. Other active equipments connected to the same antenna can cause a harmful energetic feed back through the connection cable. When it is not possible to disconnect the antenna must be carried out other possible precautions to establish a voltage absence.

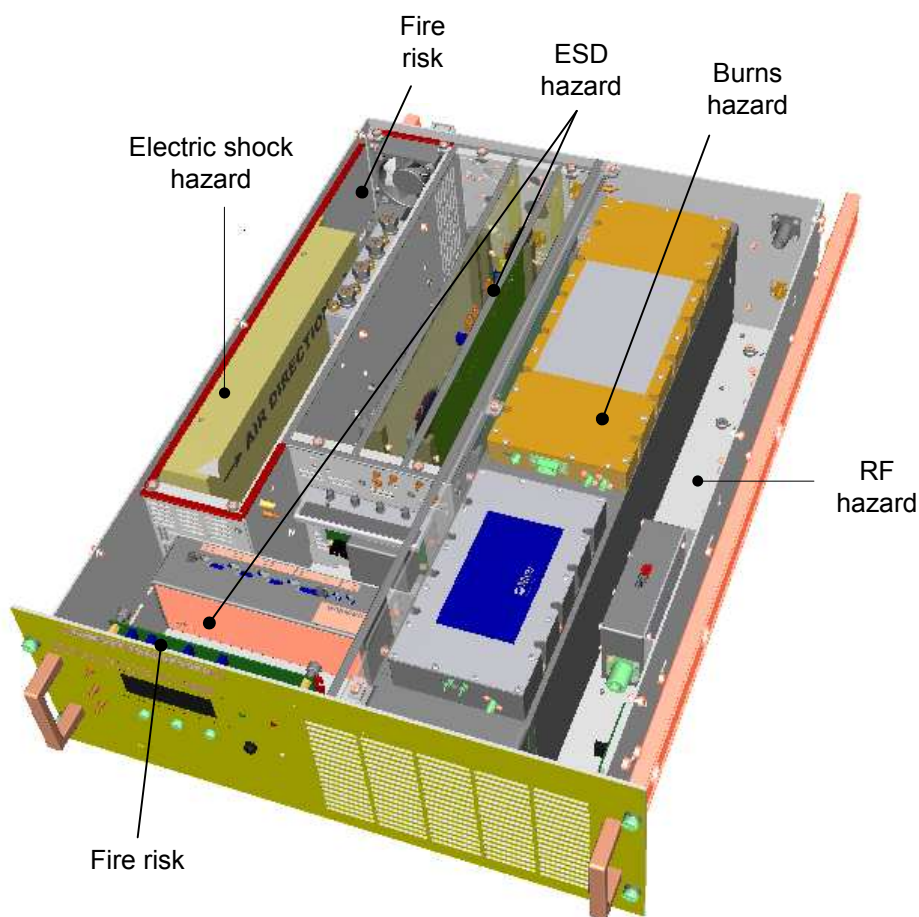



Figure 1.- Identification of the unit hazards.



|                                                                                   |                                                |                     |                                   |
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### 1.3. ELECTRIC SHOCK HAZARD


The equipments (transmitters, transposers or gap fillers) transport a big amount of energy and hence they are a hazard supply. An electric shock happens when somebody gets in contact with an electric energy supply which causes energy propagation through his body. It may cause a shock, whose consequences might vary. It could result in nothing or by contrast it could be even lethal. For this reason, pay attention to the following recommendations:

- The current intensity is the most important magnitude to predict the kind of damage suffered. The harmful current threshold is from 80mA at a frequency of 50 Hz.
- Known the relation between the intensity and the voltage, it is considered a dangerous electric potential from 24V AC or 50V DC, which can cause serious bad consequences.
- Remember that low voltage supplies with high intensity may be as dangerous as high voltage supplies.
- Do not use connections in inappropriate conditions. If it is appreciated any deteriorated connection, replace it immediately. Otherwise, it could cause either a fire or an electric shock.
- Do not remove either the external covers or the internal lids of the equipment while it is operating, unless it is absolutely necessary to do some work. One of the main functions of them is to avoid contact with high voltages.
- Do not touch the connections with wet hands. The essential resistive element of the human body is constituted by skin, which varies according to the person. The resistance among two parts of the body is within some K $\Omega$ , even though it is reduced when it is wet.
- In front of any measurement, keep one hand in the pocket to avoid the worst path current is from hand to hand since the electric flow would pass through the chest cavity.
- Electric shocks apart from producing the shock may cause burns in the part of the body which has been in contact with the electric conductor.

### 1.4. ELECTROSTATIC DISCHARGE HAZARD

Electrostatic discharges (ESD) are an electric event that produces an electrostatic field discharge when bodies with different electric potential get in contact. They are extremely dangerous for electronic devices and therefore it is important to bear them in mind. Please, follow the next recommendations:

- Ensure the discharge of the static electricity of the operators and electronic devices that have been able to accumulate before touching any device or connecting devices.

|                                                                                   |                                                |              |                     |
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- Ensure that the ESD precautions are fulfilled before extracting PCBs. Always hold up the boards with the edges. Do not touch ever the board either through the print circuit or the connection pins.
- Handle ESD sensitive devices in a free static electricity area. If it is possible, use anti-static carpets in both floor and workstation.
- In order to transport ESD sensitive device, put it in an anti-static bag.
- If it is required to touch electronic devices of the equipment during its either installation or maintenance, the operators must be equipped with ESD protection. For instance, they can use an anti-static wrist.
- Avoid contact between boards and clothes. If an anti-static wrist is used, take care: it only protects the board versus body static electricity. Thus, clothes might damage boards.

#### 1.5. RF HAZARDS


Since RF lines may also cause certain damages, in the following lines it is described several recommendations to prevent hazards related with equipments that include this kind of lines.

- Ensure neither switch on the unit with RF lines in open circuit nor disconnect these lines when the unit is operating. Although the unit possess protection versus these events (signal is deactivated automatically), it could result in serious damages to the personnel.
- When an event as just explained happens, electric arcs may be generated, producing ultraviolet radiation. If these arcs have enough intensity, they may cause burns and temporal ocular injuries.
- When an instrument (wattmeter, spectral analyzer,...) has to be connected to a high frequency output, use suitable attenuators or dummies to avoid damages to the unit final amplifiers and to the measurement instrument.
- Do not remove either the external covers or the internal lids of the equipment while it is operating, unless it is absolutely necessary to do some work. One of their main functions is to avoid external dangerous radiation produced by the unit.

#### 1.6. FIRE RISK

Even though it is not much common, there is a risk fire in presence of electronic equipment with these features. Moreover, flames and heat applied to the unit produce extremely dangerous gases generated by the devices materials. For this, pay attention to the next good practices:

- Ensure that the operators have basic formation of fire-fighting. Apply the most appropriate methods with specialised anti-fire material.

|                                                                                   |                                          |              |                     |
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- Ensure the absence or the shortage of flammable materials in the room where the unit is located.
- Ensure that all the doors of the room are closed to prevent a possible expansion in case of fire.
- Do not remove either the external covers or the internal lids of the equipment while it is operating, unless it is absolutely necessary to do some work. One of their main functions is to avoid physical contact that could produce a short circuit. Then a fire could origin.
- When a fuse replacement is performed, original fuse with the same electric specifications has to be used. Otherwise, an excessive current though a fuse could cause a fire if it is not prepare for this intensity of current. The features of the fuses are shown in Table 1.


| Unit Power                   | Size | Typical current rating (230V) | Maximum current rating (110V) | Interrupting rating |
|------------------------------|------|-------------------------------|-------------------------------|---------------------|
| 1-2-5-10Wrms<br>1-5-10-20Wps | 5x20 | 0.7A                          | 2A                            | 4A                  |
| 20-25-50Wrms<br>100-200Wps   | 5x20 | 2.7A                          | 6A                            | 8A                  |
| 100Wrms                      | 5x20 | 7.7A                          | 8A                            | 10A                 |

Table 1.- Fuses features depending on the unit power.

|                                                               |                                                               |                                                                 |
|---------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|
| AC INPUT: 110-240V 47-63Hz 4A<br>DOBLE P/N FUSING: L 250 T 4A | AC INPUT: 110-240V 47-63Hz 8A<br>DOBLE P/N FUSING: L 250 T 8A | AC INPUT: 110-240V 47-63Hz 10A<br>DOBLE P/N FUSING: L 250 T 10A |
|---------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|

Figure 2.- Identification of the fuses in the equipment.

- When a fuse replacement is performed, caution with double pole/neutral fusing.
- Use always an original battery to replace control board battery. The features of the battery must accomplish:
  - Designation IEC: CR 2032
  - UL Recognition: MH 13645 (N)
  - Nominal Voltage: 3 V
  - Typical Capacity: 230mAh
  - Diameter: 19.7 (min), 20 (max)
  - Height: 2.9 (min), 3.2 (max)

|                                                                                   |                                                |                     |                                   |
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**CAUTION**

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE**

**DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**

- Avoid placing the battery in reverse polarity, as well as do not charge and do not short circuit it.
- Battery disposal method should be in accordance with local and state regulations.

**1.7. DIRECTIVE 1999/5/EC (R&TTE)**

It is declared the conformity with the Directive 1999/5/EC (R&TTE) of the European parliament. This directive, which is from 9 may 1999, is related with hertzian equipment and telecommunications terminals, and it declares that the equipment fulfils with its essential requirements.

The Declaration of Conformity related to this product can be found in the following URL: [www.mier.es](http://www.mier.es)

The following CE mark is affixed to the equipment:



The identification number of the NO (Notified Body) who certified the product might change.

The equipment is intended to be used in all EU (European Union) and EFTA (European Free Trade Association) countries.

The use of this equipment may be restricted to certain frequencies and requires a license for operation. For more details, contact with your TAS.

**1.8 FCC RULE PARTS 15.21 AND 15.103**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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|----------------------------|--------------|
| <b>SAFETY INSTRUCTIONS</b> | <b>12/87</b> |
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